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Pam 409

THE CANADIAN PACIFIC RAILWAY;

THE NEW YORK PUBLIC LIBRARY
ASTOR LENOX & TILDEN FOUNDATIONS

BY

GENERAL M. BUTT HEWSON,

(Formerly, Originator and Promoter of the Memphis and Louisville Railroad; Chief Engineer [under Commission from the State of Mississippi] on the Memphis and Charleston Railroad; Chief Engineer of the Mississippi Central Railroad; Chief Engineer of the Arkansas Midland Railroad; Consulting Engineer of the Mississippi, Ouachita and Red River Railroad, etc., etc., etc)

TORONTO:
PATRICK BOYLE, PRINTER AND PUBLISHER, 16 FRANCIS STREET.

1880.

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TO

THE MEMBERS

OF THE

BOARD OF TRADE

OF

THE CITY OF QUEBEC

THIS PAMPHLET IS INSCRIBED IN ACKNOWLEDGMENT

OF THEIR APPROVAL OF ITS VIEWS

BY AN ACT OF

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TO

THE AUTHOR.

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PREFACE.

THE distances set forth in the following pages are taken by compass-steppings from the map. They are simply approximations. The statements of cost are put in the sense that their amounts are sufficient to construct a railway, not by any means of the first class, but one which can be made to answer the expediencies of the case. They are stated on a general knowledge of the cost of railways in a new country, under similar physical conditions.

As said in the text, the line laid down is laid down but as a basis of discussion. I find reason to think that investigation will lead to determination of a line crossing the Nelson elsewhere than at Norway House. A survey made by the Pacific Railway service shows that between the heads of the River Sturgeon and the heads of Lake Nipegon, the country immediately north of the height of land for a length of nearly 400 miles is very poor. Dr. Bell's reports lead me to the belief that that poverty continues at some points down towards the banks of the Albany. They speak of the clay soil of the Nelson extending as far south as Berren's River and also to what they call "the height of land"—a phrase which is wanting in that quarter in definiteness. Other information concurs with these statements in leading me to think that the worthlessness, agriculturally, on the line between Lake Superior and Lake Winnipeg, applies considerably farther to the North. There is some reason for the opinion that to keep the proposed route well within the rich soils of Rupert's Land, it must cross the basin of the Albany as rapidly as possible; and follow the heads of the Equam, the Weemisk, the Deer, the Severn, &c. The undulations incident to that course are of but little moment in a country whose surfaces are so uniform. They offer no consideration worth a moment's thought in comparison with the advantage of a location which, running through fine soils, combines with it the most favorable possible accessories of settlement—a system of water-ways.

This pamphlet rests to but a small extent on my individuality. It takes its positions on other grounds by stating where their proof has been found. Its thinking rests on reasonings whose truth or falsehood the world can determine for itself without any reference to me. My personality and motive having, however, been dragged into the subject, it may be well to state both as they really are.

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Though bound to the United States by many friendships and by the love I bear my children, I am not one of its citizens. I have never ceased to be a British subject. The military rank I have the honor to have held in the United States was obtained when the State in whose service I won it had been in process of "reconstruction." It was obtained, therefore, outside conditions which did not exist at the time within the limits of that State—outside conditions of citizenship. I give this explanation as a simple matter of fact, but certainly not in a sense of apology for my acceptance of a distinction whose obtainment is a subject of pride with better men.

To satisfy further inquiry I beg leave to add that I am an Irishman. A Civil Engineer by profession, I have practised under Sir John McNeil, Mr. Leahy, Mr. Gravatt; and also in the service of the Imperial Government. Twenty-odd years ago I lived for three years in Ontario, part of that time in promotion of a railway northerly from Whitby. Subsequently I went to the United States. In 1875 I returned to Canada, and from that to this have been led to hold myself secluded save when a few years ago I published a pamphlet on the Grand Trunk and a few months ago a pamphlet on the Pacific Railway.

Some people inquire into the motive of my pamphlet on the Pacific Railway. To the general one of making myself known in my profession, I add, in reply, the special one of breaking down a system which works the exclusion from the public service of Civil Engineers who entertain similar views to mine on the independence of our profession. Sir John Macdonald made me an offer twelve months ago personally and sent me a repetition of the offer subsequently by Hon. John O'Connor, of professional employment under the Crown. Even though the offer had been acceptable in all other respects—and it was one, I understand, of $3,000 a year—I would still have been unable to have accepted it, for the reason I assigned at the time, the reason that, unable to bend my professional judgment to the uses of politicians, my acceptance would have been followed within a month by dismissal. A sufficient motive for my course on the subject of the Pacific Railway may, therefore, be found in my anxiety to show the character of its management in order to obtain some such modification of the public service as may enable Engineers to maintain their connection with the political power in the independence in which that connection is maintained by the bar.

I have only to add my acknowledgements for cooperation in the production of this pamphlet to some gentlemen in Quebec. M. Tache, the Deputy Commissioner of Crown Lands in that Province, has kindly met my enquiries by supplying me with a map on which he had caused

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valuable information to be placed in my hands at the cost of much labour. M. Chs. Edouard Gauvin, a Provincial Land Surveyor, has shown his devotion to the national interests involved in the subject by giving his professional service in the production of the original of the map accompanying this pamphlet—giving that service gratuitously. Mr. Peverly, another Provincial Land Surveyor of Quebec, has also assisted me kindly by a highly interesting report on the subject of the country from Lake Mistassini to Lake Abittibi, near "the height of land."

M. B. HEWSON.

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ERATTA.

Page 2—line 43. For "boundary" read "parallel."
Page 21—line 39. For "oats" read "barley."
Page 26—foot-note. For "Nasse" read "Sestout."
Page 28—line 20. For "somewhat" read "decidedly."
Page 31—line 16. For "fine" read "good."
Page 32—line 26. For "Wakanitche" read "Wakawitchie."

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THE CANADIAN
PACIFIC RAILWAY.

The choice of route for the Canadian Pacific Railway applied over a vast breadth. With but 10,000 people in British Columbia, and but 40,000 *en route*, there was virtually no existing development to involve a restriction on the scope of the selection. But "statesmen" with the contracted views incident to public life in a struggling Colony, and advised by a railway-experience which stands characterized by the general fact that not a railway in even the fair Province of Ontario "pays," have made that selection in, very naturally, the shore-keeping of little ships. They have hugged the few settlements on the coast of the Georgian Bay; kept within sight of the handful of miners on the coast of Lake Superior; passed within hailing distance of the town-lot speculators of Kaministiquia; steered close to the insignificant population of half-breeds and others in Manitoba; and, finally, made for the shore where they saw a little village of whites and Chinamen on Burrard Inlet!* The route which has been selected has, in short, been selected in the narrow fashion of mere politicians, rather than at the promptings of bold thinking and broad practical intelligence.

Based on Montreal, the line adopted for the Canadian Pacific, has its winter-outlet in the State of Maine. It traverses the valley of the Ottawa to Lake Nipissing. Proceeding (under a declaration of Parliament!) along the southern shore of that Lake, it follows the northern shores of Georgian Bay and Lake Superior. Going on to the Province of Manitoba and traversing the country immediately South and West of Lake Winnipeg, it crosses the plains to the Rocky Mountains. Passing through that range by way of Yellow

* The truly practical is neither timid nor purblind. It dares to "look beyond its nose." Now, what is the actual value of all the above adherence to actualities? At the rate contributed by the people of Ontario to the railway-traffic of the Province—$6.85 per head—the 50,000 people between Nipissing and the Pacific would contribute to the Pacific Railway $350,000 a year. Equivalent to a capital of seven or eight millions of dollars, that item is certainly not an overruling consideration in a question involving, as the location of the Pacific Railway does, whether in reference to the accomplishment of its design or the cost of its construction, fifteen or twenty times that amount. But of the 10,000 people in British Columbia, not more than two or three thousand reside on *any* line of the Pacific Railway; and of these, the proportion identified with the mining interests of Cariboo will contribute to a northern route as well as to a southern—a northern route commanding exclusively the business of the mines of the Omineca. The 35,000 or 40,000 people of Manitoba were as available for contributions to traffic whether the line went north of Lake Winnipeg or south; and their shipments on the northern line would have given a powerful stimulus to settlement by a line of regular steam-communication for 300 miles along the eastern border of "the fertile belt," between Winnipeg and Norway House.

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Head Pass—latitude 53°—it descends through the vallies of the Thompson and the Fraser to the Pacific Ocean, at a point (latitude 49½°) on Burrard Inlet, about twenty miles from the frontier of the United States.

For about a thousand miles between the valley of the Ottawa and the Province of Manitoba, the line just traced across the Continent traverses a country whose areas fit for farming are small and few. For that vast length the track lies through a region which is held in general acceptation outside any necessity for recitals of evidence here, to present an almost continuous succession of swamps, denuded rocks and poor, if not absolutely soilless, ridges. Narrow vallies suited to agriculture offer here and there along that great division of the line; but not to an extent to bring in question the declaration that for a thousand miles out from its terminus in the woods of Lake Nipissing, the great Canadian highway offers little or no hope of reducing the burden of its cost to the tax-payers of the old Provinces by sales or mortgages of its lands.

At the termination of the division just reviewed, the line enters rich soils. From the ninety-sixth meridian—in the Province of Manitoba—it extends for 400 miles through a country which, if not unequaled, is certainly unsurpassed on the continent of America as a field for the production of wheat. A survey by the Canadian Government has established that fact for a breadth of nearly 200 miles in the certainty of close and systematic exploration. The productiveness of these lands is shown on thousands of farms now under crop; and in also an extensive movement into them from the Province of Ontario. The World's Fair at Philadelphia directed attention to these soils in the publicity it gave to the fact that they yield from thirty to forty bushels an acre, of a wheat-grain so exceptional in quality that it weighs between 64 lbs. and 68 lbs. per bushel—between four and eight pounds in excess of the ordinary weight obtained elsewhere.

At the end of the last foregoing division, the route leaves what is called the "Fertile Belt." It enters there a region in which the American Desert may be traced in gradual transition into the good soils by which it is surrounded on the east and on the north and on the west. That desert is shown on the latest map of the Chief Engineer of the Canadian Pacific Railway to present itself across the international boundary between the 108th and 111th meridians as a "cactus plain," and between the 105th and 110th meridians as "extensive plains, more or less barren." On a map of the Surveyor General of Canada it is seen to cross the 49th boundary in a width—between the 108d and the 111th meridians—of 7½ degrees, and of a character which that officer assigns to it for nearly two degrees farther north, in the description: "generally barren lands."

Captain Palliser places the American desert nearly as far west as the 113th meridian. His testimony completes the proof that that

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vast tract crosses the boundary in a width of twelve or thriteen degrees. The Surveyor-General of Canada identifies it in "barren lands," extending nearly to the 51st parallel of latitude. It can be traced beyond that in gradual modification as far as the 53rd parallel, by its boulders; its gravel; its treeless surfaces; its salt marshes; its alkaline lakes; its coarse grasses; the rarity or the absence of streams, of springs, of ponds. For four hundred miles, the route of the Canadian Pacific Railway lies within or near the upper edges of that dry, bleak and poor region. The country on the northern side of that section of the line is described by the Surveyor-General as "mixed prairie and timber; soil rather light; but produces fair crops." The country on the southern side of it is described by the same official in the words:—"Open" (that is treeless) "plains; poor soils; possessing occasional tracts fit for settlement." All this comes under the corroboration of Captain Butler when he says, pages 351 and 357 of his "Wild North Land" (London 1874):

"A line has been projected across the Continent which, if followed, must entail ruin upon the persons who would attempt to settle along it, upon the treeless prairies east of the mountains. * * * The present line through the Saskatchawan is eminently unsuited to settlement; it crosses the bleak poor prairies of Eagle Hills, &c. * * * For all purposes of settlement, it may be said to lie fully 80 miles too far south during a course of 300 or 400 miles. * * * Rich soil, good water, and timber fit for fuel and building * * are almost wholely wanting along the present projected route through some 350 miles of its course."

The foregoing general statements may be repeated with more point and force by citations from surveyors' reports.—Through a country wanting in wood, water or grass, the travellers' trail cannot be taken as an average representation of the whole. A *selection* of experience, it pursues a course on which these wants present themselves in the least degree. But surveyors' lines following fixed directions, exhibit such a region in severe truth. Some of these faithful insights into the character of the country on the route of the Pacific Railway, shew that character in Reports of the Department of the Interior. Surveys (reported in 1877 and 1878) on "the 10th base" and on "the 11th correction line"—between the 103rd and the 110th Meridians—follow the route of the Pacific Railway at a distance varying from a few miles north of it to 45 miles south of it. Applying closely to the country traversed by the Railway for a distance of 300 miles, the following descriptions of the ground tell their own story of the middle section of the plains, on the way to Yellow Head Pass.

To Fishing Lake (Lon. 103½°) a distance of 19 miles:

"The soil throughout this section is good sandy loam, and most of the timber of useful dimensions."

To Big Quill Lake (Lon. 104¼°) a distance of 32 miles:

"Well supplied with wood and water, having a soil sandy loam of fair quality, lying between Quill Lake and the Touchwood Hills. The

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streams running into Quill Lakes are all fresh water; whereas the Lakes themselves are strongly alkaline."

Turning north for 20 miles to a point beyond the railway, the Surveyor's line is reported thus:

"The first six miles are on the sandy alkaline strip between Big and Little Quill Lake. Some fair sized timber is found here, but the soil is poor; and continues so through a more open country until within 3 miles of the C. P. R. line, when we encounter rising ground, densely wooded, with large poplar and numerous ponds."

Turning westward on the 10th base, the survey proceeded at an average distance of about ten miles from the railway for a stretch of 180 miles. The Report of 1877 says of that line:

"The wooded and pond-country continues for about 27 miles, when the country becomes more open and inviting; and continues so to the 40th mile, when we gradually descend into an almost barren, rolling, alkaline, sandy plain. * * * For about 24 miles the line runs through the same sandy, rolling plain. On the 13th mile we crossed the Canadian Pacific Railway line where it deflects to the north, 2 miles south of an alkaline lake."

The Report of 1878 continues to review the same survey line from the close of the above. It says:

"I experienced great difficulty in making progress" (for 108 miles) "on the 10th base owing to the want of wood and water, the country along that line being almost destitute of both. On one section of it water had to be carried for the party and wood for posts and fuel, in our carts, for a distance of 32 miles. The soil on the part surveyed of this line" (108 miles) "with the exception of some few miles in the Eagle Hills, is of a poor nature, being light and sandy and in most cases alkaline. In fact none of the country between the 106th meridian and the point at which I turned northward" (an interval of over one hundred miles) "is of any use for agricultural purposes."

Turning northward at the end of the line just reviewed, the Surveyor describes the country traversed (for 36 miles) thus:

"Of a better nature than on the 10th base; for though the soil is light, it is well watered and the pasturage is excellent. It is, however, destitute of wood."

From Battleford to the 110th meridian, the line (75 miles in length) is reported thus:

"The soil generally is exceedingly poor; and although improving a little in the immediate vicinity of Battleford, is even there very light and sandy. * * From the Meridian Ranges 18 and 19 to the 110th Meridian the country is decidedly more attractive. For the first 30 miles there is a scarcity of wood; but water abounds. Indeed as a rule this was the only country" (in a course of over 300 miles) "passed over in which the water met with was not more or less alkaline. * * * From the exceeding richness of its grasses and the special fitness of the kinds produced, I am led to believe that it" (a tract of 30 miles wide near the 110th meridian) "excels as a grazing country anything I have seen in Manitoba or the North-West Territories."

In summary of the foregoing and of other evidence on the subject, it may be concluded that for 400 miles across the plains the adopted

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route, while presenting exceptions here and there, traverses a region whose soils and other circumstances may be said in general to be unsuited for agricultural settlement.

Passing out of the region of desert-transition, the railway runs, according to the maps of Mr. Marcus Smith and the Surveyor-General for a hundred miles through excellent lands. At the end of that section it proceeds for a further length of 100 miles through a succession of forest-swamps. Leaving that district of marshes, it enters the Rocky Mountains; and going on thence through the deep gorges and *canons* of the River Thompson and of the River Fraser to Burrard Inlet, traverses a region which, described by a Canadian orator "as a sea of mountains," offers no considerable breadths of land fit for cultivation. Mr. Smith's map limits the surface not utterly worthless on the line west of the Rockies to a width of about ninety miles—less than one-fifth of the whole length of that division of the railway. That area he describes thus:

"High, undulating plateau between the Rocky and Cascade Mountains. The south eastern portion has" (that traversed by the adopted route down the Thompson and Fraser) "little rainfall; but produces luxuriant bunch-grass;* and the bottom land and benches (where they can be irrigated) excellent wheat and other cereals, as well as vegetables."

In his Report of 1878, Mr. Acting-Chief-Engineer Smith says further:

"From Yellow Head Pass to a point within a few miles of the confluence of the two branches of the Thompson at Kamloops—about 235 miles—the country is unfit for settlement. The Upper Fraser, Albreda and Thompson Rivers flow through narrow, deep and rock-bound vallies with scarcely an acre fit for cultivation."

Speaking of the length of the line crossing the plateau or bunch-grass region, Mr. Smith says in the same Report:

"In the bottom lands of the vallies and on the benches adjoining, the soil is very rich, producing excellent wheat and other cereals as well as vegetables. These lands, however, are scattered throughout the plateau in isolated patches; and bear a very small proportion to the whole area. They generally require irrigation, which can be obtained to a limited extent."

In the Geological Report for 1877-8, Mr. Dawson makes many incidental statements in pointed corroboration of the foregoing words of Mr. Marcus Smith. Speaking of the vallies of the Fraser and Thompson, he says:

"The extreme upward limit of agriculture may be stated at 3,000 feet; and it will be observed that the greatest area of comparatively level plateau country lies above this elevation. * * * Farming is, in consequence, practically confined to the trough-like valley bottoms or slopes adjacent to them; and in most cases to those portions of these on which water may be brought for irrigation. It is beginning to be

* Bunch-grass is subject to total eradication by much grazing.

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found, however, that fall wheat may be grown on many of the higher benches on which water cannot be obtained, the moisture left by the winter's snow being sufficient for its development in an average season. * * The greater part of the plateau up to and in some cases above 3,000 feet, offers excellent pasturage. Stock-raising is thus at the present time much more important than agriculture in the district, and must continue to be so."

Of the Fraser Valley between Lytton and Lillooet, and of the South Thompson—all on the adopted route—Mr. Dawson says:

"There are, however, some pretty farms on the South Thompson and spots yet unoccupied. * * An extensive flat standing at a height of about 20 feet above the river, is found at the lower end of Little Shuswap Lake. Its area may be nearly two square miles. Three farmers are settled here. There is also about the extremity of the Salmon Arm, in addition to what may be considered as the immediate delta of Salmon River, several square miles of flat country standing less than 300 feet above the lake. * * No land exists suitable for agriculture except on a very limited scale. * * * All the patches of land suitable for farming appear to be already taken up; and the stock ranges in the vicinity of the River" (Fraser) "are quite limited in area."

Mr. Marcus Smith says in his Report of 1878:

"From the Pembina River across the Rocky Mountains to a point near Kamloops, 420 miles, is totally unfit for settlement. There is another length of 100 miles in the canyons of the Thompson and Frazer in a similar condition. So that from the River Pembina, on the east side of the Rocky Mountains, to the proposed terminus at Port Moody, a distance of 679 miles, there are 520 miles on which there is no land fit for settlement; and on the balance, most of the land is taken up; in all this distance, therefore, there will scarcely be an acre within 60 or 100 miles of the line at the disposal of the Government for railway purposes."

The review just made shows that, as for a thousand miles *west* of the *eastern* terminus, so also for five hundred *east* of the *western* terminus, the great Canadian highway offers on the route adopted, little or no hope of reducing the burden of its cost to the tax-payers of the old Provinces by sales or mortgages of its lands. Of the whole of the adopted route it may be concluded with safety that the cost of the construction of the railway must be borne by those tax-payers, except where that cost may be contributed to by the unsurpassed soils which offer along two divisions aggregating a total length of but 500 miles. So much in review of the location of the railway in reference to the policy of its construction by sales or mortgages of its lands. And now for an examination into its relation to political interests of the Dominion and Empire.

The British sympathies of the people of Canada give vitality for the present to the Canadian Union. But looking beyond these, there can be seen but little in the existing relations of its parts to give it permanence. The agriculturists of Ontario have, certainly, little reciprocity of convenience or of interest with the shippers and fishers of New Brunswick or of Nova Scotia. The latter would reap, as

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things now stand, more profit than they do under their rights in the markets and in the carrying trade of a few poor Colonies, if they enjoyed, instead, free access to the consumption and to the freights of a country so rich, active and great as the United States. A bond of union in restraint of that class of the forces of disintegration, may be obtained from the location of the Pacific Railway with a view to the highest possible development between the British Provinces, of a reciprocity of material interests. As the Colonies which were strung out a hundred years ago in a thin line along 1500 miles of the North American shore, obtained a nucleus of union in the common inheritance which stretched out in rich and vast plains on both sides of the River Mississippi, so the Colonies which are strung out now in a thin line for 1500 miles along the frontier of the United States, can obtain a nucleus of union in the common inheritance which stretches out in rich and vast plains from Lake Winnipeg to the Rocky Mountains.

The Canadian Railway across the American Continent has been assigned its route without much consideration for its use as a means of binding the Provinces of the Dominion together in a reciprocity of interests. By making Lake Superior the discharge point during summer, of the inward and of the outward business of the Canadian future, it makes that business *en route* a subject of competition on neutral waters between the carrying, the mercantile and the manufacturing interests of the United States, and the carrying, the mercantile and the manufacturing interests of Canada – of the people who would otherwise enjoy that business in the exclusiveness of an economic right! To strive with the United States for the trade and commerce proper to the basin of the great lakes is one thing; but it is another and very different thing to expend millions of money in order to draw into that "pool," to be played for with the Americans, the whole *future* of the Dominion, while that whole future may be drawn to Atlantic tide-water as a monopoly of the trade and commerce of the Canadians.

The adopted route of the Pacific Railway would draw all the productions of the North-West along the lines of navigation centering at Winnepeg, southerly. In that it goes to a continuance of the summer struggle which it opens on Lake Superior—goes to its continuance in the form of rivalry throughout the winter between the great Canadian railway and rival lines of the United States. And what American commerce may fail to carry off in this latter conflict from Winnepeg, the route chosen for the Pacific Railway takes care to return to American commerce at Montreal. For, based on a *statu quo* proper to development within certain limits, that route gives the whole commerce of a future which lies entirely outside those limits—gives it by virtue of prohibitory lengths of transportation to St. John and to Halifax—to Portland! That subordination of the intercourse with the Ocean of a Dominion which may be wrought into an Empire, to the good pleasure of a foreign nation, proceeding as a

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necessary consequence of the set given to what stands to the material life of that Empire as its main artery, is, therefore, a subordination for all time. And yet that force of disintegration might have been reversed if the route of the highway across British America had been chosen with the design of placing the eastern Provinces of the Canadian Confederation in the same relation to the millions of agriculturalists who will occupy its Western Provinces, as the Eastern States of the American Confederation occupy to the millions of agriculturalists who occupy its Western States---making Ontario and Quebec the bankers and manufacturers of the Dominion, New Brunswick and Nova Scotia its factors and carriers.

Taxation in Canada is very much lighter than taxation in the United States. Direct and powerful as the influence of that difference is on the maintenance of the British American organization, its elimination is adverse to Imperial policy. Now the route adopted for the railway across the Dominion lies for 500 miles through the most difficult country in British Columbia: for 1,000 miles through the most difficult in Ontario. The first of these two sections costing $62,000 a mile, and the last costing from $27,000 to $83,000 a mile, there can be little doubt that the construction of the railway on the route selected will have involved the credit of Canada to the extent of a hundred and ten millions of dollars. At an interest of four and a half per cent., that sum will consume taxes to the amount of about five millions a year. The cost of maintenance is estimated by one of the Government engineers for a small traffic, at $2,327 per mile; but at even half that, it would consume taxes at the rate of about three millions a year. The running expenses amounting to, at least, two millions a year, the annual burden of this great enterprise on the adopted route, and at its present scale of construction, may be set down at about ten millions of dollars per annum. In almost any event the undertaking on the present route will involve some such burden for a long time after its completion; but what prospect is there that relief from that burden will ever come?

The character of the country on the eastern section of the adopted route and that on the western section is, as has been said above, highly unfavorable. The effect in gradients and curves must be more or less injurious; and represents, therefore, excesses in the cost of working. The scale on which the works are designed—making a road suited to large traffic in the teeth of the fact that it cannot expect a business of more than two through trains a day for several years—adds unnecessarily 100 per cent. to the interest of capital and from 50 to 80 per cent. to the cost of maintenance. And all these drawbacks in the competition with the trans-continental railways of the United States for through-business to and from the Pacific, are more or less aggravated by a crossing of the Continental summit at Yellow Head Pass, while that summit might be crossed elsewhere at an altitude from 20 per cent. to 35 per cent. less. These causes

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combining in weakening the force of expectation of "through-business," the trains coming eastwardly cannot count confidently on any considerable amount of freights until they shall have reached the plain east of the Rocky Mountains. The 500 miles of rich country on the way to that, will at some future time contribute to their loads as they advance, until, finally, the loading having been completed, the trains must surrender them to American or to Canadian steamers on Lake Superior! In order to keep up the through-working of the line, they must then proceed for thirteen hundred miles to Montreal empty! Under such a state of things, it must be concluded that, the cost of construction unnecessarily heavy, the mechanics needlessly unfavorable, and the design in reference to traffic one of recklessness, the Railway across British America compromises, if not Canadian credit, that low rate of taxation which operates as a safe-guard against the forces of "annexation."

The terminus of the British Railway to the Pacific is planted—on Burrard Inlet—within 20 miles of the American frontier. Every part of the track for 70 miles on this side of that terminus, lies within a day's march of that frontier. The Asiatic intercourse which the line is expected to attract to British waters in competition with the United States, the route chosen assigns to a channel seaward, under guns of the United States. In short the Pacific Railway fixes the vitality of British development on the American shores of the Pacific within convenient clutch, on land and water, by forces of the United States. It does this in rejection of the only opportunity that is ever again likely to offer for planting a *reserve*-development of British power on the western shore of North America, away from the shadow of American belligerency.

Not only in British Columbia does the route across the Dominion disregard the uses of the Railway as a line of defence. It does so, if possible, more strikingly on the east of the Rocky Mountains. For a length of 400 miles between the capital of Manitoba—the City of Winnipeg—and Lake Superior, it lies within convenient access from the frontier of the United States—at no point farther than four days' march, at some points not so far as two. For 200 miles it offers several opportunities of seizure by parties making a raid of a few hours from vessels dominating Lake Huron and Lake Superior; and supplies thus a means of taking the defence of the Provinces of Ontario and Quebec in reverse. Planted at Montreal, in a position not highly defensible by either land or water, the very terminus of the line on Atlantic tide-water may be seized by a force from the United States within forty-eight hours of the concentration of that force, by railway from the south, on the border of the great State of New York.

Though the Canadian highway to the Pacific has been assigned to a route in the foregoing surrenders of Imperial policy, it must still be regarded a subject of great interest to the Empire. Military and telegraphic and postal communication across the American Continent,

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even when subject to interruption by an enemy from the United States, is of great importance to Great Britain. But the railway is of still greater importance as a means of sustaining the footing of Great Britain against American enterprise and diplomacy in Japan and China. True: Asiatic commerce is regarded by some as outside the attractive energies of a trans-continental railway. In the sense of freights whose bulk or weight bear a high proportion to their marine insurance, that proposition is true. Once on the sea, that class of commodities will not go, *en route*, to the rail. Ships abhor short voyages. But the highway to the Pacific through British America opens a struggle with the highway to the Pacific through the United States, none the less real for traffic with Japan and China in such commodities as spices, drugs, tea, gold, silver, &c., as linen, calicoes, ribbons, cloths, &c. &c.

The Americans not only understand that fact, but they estimate it so highly as to have made it for several years past the basis of a policy of active aggression. Having completed one railway to the Pacific by Government subsidy, they are pressing forward two others by Government subsidies; and have extended the attractive force of the track in operation by a line of steamships which run with the assistance of a Government subsidy, from San Francisco to Yokahama, Shanghai and Hong Kong. From the time of the Burlingame-treaty until General Grant had been sent as a roving envoy to impart special energy to ordinary diplomacy in support of these powerful agencies, the great Republic has been working wisely and well to give full effect to its geographical position as a means of commercial ascendancy in the Northern Pacific.

In this point of view it is difficult to over-estimate the importance to England of the great Canadian Railway as a means of foiling attack by planting the Pacific *entrepot* of at all events some of the intercourse of Japan and China with the Western World, in British waters. So great as this consideration is, so great as are the interests at stake in the political success and in the military defence of the Dominion, and in the retention of English energies and resources within the scope of the Empire, that it becomes a question of the very first importance whether a route across British America cannot be found combining all these points of Imperial interest with that prime necessity of Canadian credit in the construction of the line—that of supplying it to the greatest possible extent with convertible resources in lands along its route.

Formerly the outlet of all the commerce of Russia, the White Sea continues to this day to be a resort of merchant-ships. Its *southern* shore lies farther north than the *northern* limit of Hudson's Bay. The latter stops short of the advance of the White Sea into northern latitudes, by five degrees; and goes seven degrees farther to the south. And yet Hudson's Bay knows not, as the White Sea does, the ships and energies of its owners. British enterprise allows the

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wealth of that inland ocean to lie untouched, while the enterprise of the Russian and the Swede and the Dane gathers the riches of the Gulf of Obi, every square mile of which lies within the Arctic Zone, its mouth eight or ten degrees farther north than the mouth of Hudson's Bay.—Why is it that while those waters of Russia are turned to the uses of mankind, these waters of England are allowed to remain untrodden and unknown by commerce?

Hudson's Bay Company's schooners maintain communication between that monopoly's posts on the Bay, in summer. Mr. Horetzky, who had been stationed at Moose Fort for several years, says that the period of that service is two months and a half; but, he adds, that, in attending on the usual ship from England, the schooners maintain navigation for a month longer—in all, three and a half months. But the limit in the case may be supposed to be that of business, not of ice; for even James' Bay, to which the facts apply, does not become frozen until the close of October. Mr. Horetzky speaks of a schooner which arrived at Moose Fort in time to be hauled out of "the fast-forming ice" at the end of October. And Dr. Bell, of the Geological survey of the Dominion, says that the River Albany, which discharges into James Bay, is open for six months. Ellis says, in the account of his voyage to Hudson's Bay, that the ice of Hayes' River, in which his vessels wintered, broke up on the 15th of May. Hearne gives us to understand in his journey to the Northern Ocean that on his return from Cumberland House to Fort York, the rivers flowing into Hudson's Bay were navigable for canoes on October 20th. On the faith of these facts the British American "White Sea" may be set down as open water in front of Fort York for five months. While there is some reason for believing that the Bay freezes for a greater width along its southern and its eastern shores, Hearne states in effect that, except for a margin of "several miles from shore," it is always open water.

In his book on Hudson's Bay, Robson directed the attention of British statesmanship a hundred years ago to the importance of opening that shipless Ocean to commence. On pages 81 and 82 of his "Six Years' Residence," he says:

"The countries surrounding Hudson's Bay and Straits, have a sea-coast of 2,000 miles extent, * * great part of which is in the same latitude as Great Britain. Upon the sea coast are many broad and deep rivers the sources of which are several hundred miles distance, south, south-east and south-west of the Bay. * * The soil is fertile, and the climate temperate for the produce of all kinds of grain, and for raising stocks of tame cattle; and the coasts abound with black and white whales, seals, sea-horses, and various kinds of small fish."

In the dedication of his book to Lord Halifax, he adds:

"The opening a new channel for trade to a vast country abounding with inhabitants" (Indians) "and with many beneficial articles of commerce, is a work that highly merits the attention of our wisest and greatest statesmen. * * * Whales and various other fish are so

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plentiful in the Bay and in the inlets leading from thence to the Western Ocean, that the natives, etc. * * The land abounds with mines and minerals, and is also capable of great improvement by cultivation, and the climate within the country is very habitable."

In volume XII. of the Journals of the House of Commons of Canada for 1878, highly important testimony will be found on the subject of intercourse between Hudson's Bay and the Atlantic. Professor Hind, a gentleman who has placed the Empire and the Dominion under an obligation in having brought that important question forward again, has done so with the authority of one who combines the knowledge of an expert in its practical considerations with elaborate research. To that able man belongs the honor of having awoke faith in the anticipation, which appears to be but a question of time, in which he says that Port Nelson, at the mouth of the outfall from Lake Winnipeg into Hudson's Bay, will become some day a British American City of Archangel. Discharging the waters of Lake Winnipeg—of the Assinaboine, of the Red River, of the Red Deer River, and of the several great streams which unite with the River Saskatchawan—the Nelson must be considered a water-course of the first magnitude. The channel to the sea of a country containing vast areas of agricultural and mineral wealth, that River has at its mouth a safe harbor which, being nearer, as Professor Hind points out, to Liverpool than New York is, embodies a conjuncture of circumstances which declares the justice of the anticipation that the vast and teeming farm-lands of the North and North-West are destined to find an outlet for production and an inlet for emigration proper to themselves, at Port Nelson. Professor Hind cites Ellis to show the character of the approaches to that port. Inasmuch as the hundred and thirty years since Ellis' visit must have worked great changes in the channel and delta of the Nelson, it is better to substitute here the following from a contribution made to the report of the Canadian Geological Survey for 1877-8 by Dr. Bell:

"The mouth of the Nelson at high tide has a breadth of six or seven miles. It continues to narrow gradually to Seal Island at the head of tide-water, or 24 miles from the extremity of Beacon Point. Above this it varies from a mile to a mile and a half as far as we went. * * A narrow channel with a somewhat irregular depth of water winds down the centre of the estuary. From the soundings which I took it appears to have an average depth of from two to three fathoms at low-water from a point abreast of Beacon Point for about 20 miles up. At the mouth of the River the ordinary spring-tides amount to about 12 feet and neap-tides to about 6; so that at high tide from 3 to 6 fathoms may be found throughout the above distance. * * The mean velocity may be taken at from 2 to 3 miles an hour; and the average width at ¼ of a mile between the water margins. * * The Nelson River may therefore be said to be navigable for river-steamers to a distance of about one hundred miles from the sea."

But what of intercourse between Port Nelson and Liverpool? Within two or three hundred miles of the rich wheat-fields of the Canadian North and North-West though it is, and sixty miles nearer

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than New York to Liverpool though it is, and situated though it is, on the shore of an inland sea free to navigation for at all events five months of the year, what of its intercourse with the Atlantic? For over two hundred years the Hudson's Bay Company has maintained communication between Great Britain and York Factory, or Moose Factory, by from two ships to four ships every year. French men-of-war have entered Hudson's Bay during that time. Admiral La Perouse anchored his line-of-battle-ship and other vessels of his fleet within the mouth of the Nelson. British ships of war have also sailed within the Bay as convoys of the Company's vessels. The practibility of intercourse between Hudson's Bay and the Atlantic is, therefore, settled; and the only question applying in the case is the period during which that practicability holds.

In Lieutenant Chappel's narrative of his voyage (London, 1817) he gives a list of the earliest arrivals of Hudson's Bay Company's ships at the western mouth of Hudson's Straits. Of 23 in all, 6 of these show an average of the 26th of July; 15 an average of the 13th of August; the whole an average of the 10th of August. Mr. Donald A. Smith, an officer of the Hudson's Bay Company, stated to the Committee of the Canadian Commons that the Company's ships usually leave Fort York towards the close of September. Mr. Horetzky speaks of one of them which had not arrived until the 20th of September and reached England in a twenty-nine-days-run, including delay repairing her rudder, though she had not left Moose Factory until the 13th of October. But accepting the end of September as the time of departure and allowing 7 days for the run to the western mouth of Hudson's Straits, the averages of the arrivals at that point from England prove the passage good in practice from, say the first week of August to the first week of October—2 months.

But Hudson's Bay Company's facts are never good against the public interest in the British American North-West. The whole course of that monopoly has been taken with the purpose of deceiving the world as to the territory in its grasp. Robson says, in his "Six Years' Residence, &c.," that a safe entrance into Hudson's Bay may be obtained before the ice begins to run through the Straits—in the beginning of June. Lieutenant Chappel seems to agree with that opinion; for he advises that merchants anticipate the trade of the Hudson's Bay Company with the Esquimaux, by sending a vessel through the Straits early in June. These facts are cited by Professor Hind in conjunction with what appears to be a settled point, that vessels have nothing to fear on the return voyage if they leave Hudson's Bay before the formation of new ice—before the last week of October. All this points to the presumption that, whatever may be the interruptions in the meantime, there is a clear interval from the opening to the closing of Hudson's Straits of over four months.

The light thrown on the navigation of Hudson's Straits by Professor Hinds' research receives its fullness in the table in which he shows

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facts of whale-fishing in Hudson's Bay by the Americans. He gives in that table the dates of the arrivals at and of the departures from, ports of the United States, of over forty vessels which had been engaged in that business—at a result of $31,000 per year, per ship—between 1860 and 1875. In grouping all the other facts which he offers, he omits, however, to apply these in a conclusion as to the limit of the navigation of Hudson's Straits. That omission may be supplied thus: Of 49 departures, five are exceptional—in March, October, November and December. Of the remaining 44, nineteen are in April, averaging the 19th of that month; fourteen are in May, averaging the 15th of that month; ten are in June, averaging the 15th of that month. The general average of the whole—the 44—is the 12th of May. Of 42 arrivals three are exceptional—in April, May and December. Of the 39 remaining, 12 are in September, 23 in October and 4 in November, each group showing the following averages—September the 17th, October the 15th, November the 12th, and the whole showing in a general average, the 9th of October. Now taking the 19th of April as shown by nearly one-half of all the instances given, as the time of departure, and October the 15th as shown by more than half the instances given, as the time of arrival, for the working limits of this experience, the ships are seen to be out for six months. Taking the *general* averages, however, the ships are seen to be out from the 12th of May to the 9th of October—five months. Allowing one month as the average time between the western mouth of Hudson's Straits and the coast of Massachussetts—one month going and one month coming—this great breadth of actual practice proves that ships of the Atlantic may count on the transaction of business within Hudson's Straits for three months, on the broader basis of proof, and on the less broad but still ample basis, for four months.* This conclusion applies to sailing vessels, leaving Professor Hind the remaining work of his labour of love in proving whether the Straits are practicable for four months continually, and proving how far that period may be extended by the special appliances and experiences of the seal-fishing steamer.

In answer 5001 to a Committee of the Imperial Parliament (1857) the freight rates to or from London by the Hudson's Bay Company's vessels is seen to have been fixed by that monopoly for merchandise other than its own, at two pounds sterling per ton. That applied thirty years ago in an outcome of a grasping exclusiveness. It is hardly too much to say that the competition for the carrying trade with Europe which would apply in Professor Hind's British American Archangel, would reduce that rate to or near the rate from Montreal and New York. That Colonel Crofton when on his way, in 1846, to what is now the Province of Manitoba, completed without difficulty a voyage from Cork by landing safely at Port Nelson with heavy guns, ordnance stores, 347 officers and men and 36 women

*An official publication of the Interior Department cites a merchant of St. John, Newfoundland, as authority for the statement that Hudson's Bay is accessible to ships for five months.

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and children, is a fact brought out by the Parliamentary Committee of 1857, one which speaks suggestively of the adaptation of the southern shore of Hudson's Bay as a landing-place for emigration and a base of defence. And the new Archangel which offers these opportunities, offers more for the interests of the Empire in North America —offers a reversal of Canadian dependance on the United States for access to the sea, offers it from a sea-board so far to the west as to bring under economic attraction during, at all events, the period of navigation through Hudson's Straits, the Ocean-intercourse of the regions on the Red River, the Upper Missouri, the Yellowstone, the Platte—including the States of Minnesota, Nebraska, Dakota, Montana.

The Yenisei debouches into the Arctic Ocean in a latitude of about 72 degrees; the Obi in a latitude nearly the same. Supposed to have been closed by an ice-bound sea, they had not been approached by ships until recently. Their wheat-surpluses supply freights now to German and English commerce on the Northern Ocean. The Mackenzie is a British River. As fine a water-course as either of those, it traverses a wheat-field unsurpassed in productiveness. In vain does it offer to contribute to British wealth by depositing its riches on a seaboard whose latitude is less than 69°—three degrees farther south than they. As the approaches of the Yenisei and of the Obi have been supposed until a few years ago to be closed by ice, so that to the Mackenzie is still supposed to be. In his "Second Expedition to the Polar Sea" (page 34) Sir John Franklin corrected the latter mistake fifty years ago when, writing of the prospect from the mouth of the Mackenzie on the 16th of August, 1825, he said:

"The Rocky Mountains were seen from the S.W. to W. ½N., and from the latter point around to the north, the sea appeared in all its majesty, entirely free from ice, and without any visible obstacle to navigation. Many seals and white whales were sporting on its waves."

That Captain McClure sailed when making the North West passage, through the waters described thus by Franklin, is a fact which might have aroused British enterprise to a truth which American enterprise has utilized for thirty years, gathering as Admiral Beechy has told the Geographical Society, four millions of dollars per annum during all that period from the whale-fisheries of the open sea north of the mouth of the Mackenzie.

In answer 2595 to the Hudson's Bay Committee of the Imperial Parliament, Mr. Isbister testified in 1857 that the mouth of the Mackenzie is free from ice from the beginning of June to some time in October—about four months. At Fort Simpson, which is eight degrees of latitude up stream, he stated that the ice in the River breaks up in the beginning of May. Proceeding up the Mackenzie into its great affluent, the Peace, the length of the open season

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continues to increase. Speaking of that stream at its passage through the Rocky Mountains (latitude 56°) Sir Alexander Mackenzie says on page 131 of his "Voyages," that the River was about to become closed on the 26th of November. He leads to the conclusion by the resumption of his journey, that it had become open before the 10th of May. Professor Macoun says in one of his Reports to the Canadian Government that an average of ten years assigns the opening of the Peace at St. John's (long. 121°) to the 20th of April; and that its navigation at that place is good for seven months of the twelve.

The basin of the Mackenzie includes fifteen degrees of latitude and eighteen degrees of longitude. The river-system of which it is the outfall, drains nearly one-half the area of the plains of the North West—an area much larger than the aggregate area of France, Belgium, Holland, Switzerland and Germany. Mr. Isbister says in his testimony that "the Mackenzie is a fine large river," and that "it is a beautiful river." Archbishop Tache says (page 31 of his "North Western America"): "In some places it" (the Mackenzie) "is two miles broad; and, in short, as regards its length and the volume of its water, is one of the finest rivers in the world." The Archbishop says (page 31 of Cameron's translation) still further:

"The river is navigable, if not from its source, at least from Jasper House (15 degrees to the south of its outlet into the Arctic Ocean) to its mouth, a distance of about 2,000 miles. In this long line, navigation in boats of the country is interrupted at only two places, by the group of Rapids in the Riviere a la Biche and one in Slave River. The latter rapids, at about 1,200 miles from the Arctic Ocean, present the first obstacle to vessels going up the stream. Vessels of less draught could easily navigate from above these rapids to the foot of La Biche Rapids; but not at all seasons of the year, as when the water is low there are numerous sand banks in the way. From the latter rapids to the Jasper House the current is exceedingly strong and the water generally shallow, so that here navigation is very difficult, and possible only in boats of the country when powerfully propelled."

In his evidence (answers 2592-7) before the Parliamentary Committee of 1857, Mr Isbister says of the navigation of the Mackenzie:

"There is one immaterial obstruction near Fort Good Hope. I know of no other until you come to the Great Slave Lake. Vessels of considerable size could pass at Fort Good Hope and into Slave Lake without any interruption whatever. * * * The Slave Lake itself is navigable, * * * but the Slave River is interrupted by frequent portages. * * * On the Mackenzie, navigation by steamboat could be carried on undoubtedly."

Archbishop Tache and Mr. Isbister concur in the statement that vessels can navigate the Mackenzie to the mouth of Slave River. The former places the first obstacles far up-stream on the Arthabasca, but the latter asserts that they present themselves in the Slave. This conflict of testimony has been settled. The Hudson's Bay Company runs a steamboat from the Mackenzie to certain "portages" on the Slave, and makes connection with that vessel at those "portages" by

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another steamboat which runs up the Athabasca as far as the "forks" (lat. 56½°); and up the Peace as far as the Vermillion Rapids (long. 114°). From these Rapids upwards, another of the Company's steamboats plies upon the Peace to the gate-way of that River's outcome from its channel through the Rocky Mountains, at Hudson's Hope (long. 122). These establish the fact that a line of navigation by steam is obtainable from the whale-fisheries of the Arctic Ocean up the Mackenzie, to the forks of the Athabasca on the one hand and to Hudson's Hope on the other, a line enjoying free outlet seaward, and open inland from four months at the mouth to seven months on the upper reaches.

The climate in the southern part of the basin of the Mackenzie is genial. Dr. King, the naturalist of the expedition in search of Sir John Ross, said in answer 5662 to the Committee of the House of Commons (1857):

"Speaking of the very vast area of which the Athabasca is the southern boundary, I believe the temperature to be about the same as Montreal in Canada."

Mr. Horetzky, an officer of the Canadian Pacific Railway service, says (p. 47 of his Report of 1874):

"The climate of this region, and of the Peace River valley generally, is somewhat similar to that of Red River" (the wheat-field known as the Province of Manitoba) "but the extremes of heat and cold are not so great; and the climate is dry and salubrious, and is tempered by the westerly winds which here prevail and are mild; snow rarely reaches and seldom exceeds two feet."

In answer 5653 to the Parliamentary Committee of 1857, Dr. King explained that he included the climate when he said the upper parts of the basin of the Mackenzie are "well adapted for colonization." On page 131 of his "Voyages," Sir Alexander Mackenzie says he placed men at work digging ditches and cutting palisades on the Peace, in November. It has been shown already that when he was in that country the river had not been closed before the 26th of that month. On page 135 of his book, he states that the average range of the thermometer at half-past eight in the morning was, from the 16th of November to the 2d of December, from 27° above zero to 16° below—the latter a degree of cold known frequently in southern Ontario. During that period, the range at noon was between 29° above zero and 4° below. His thermometer broken, Sir Alexander describes (page 176) the remainder of the winter on the Upper Peace thus:

"On the 5th of January, in the morning, the weather was calm, clear and cold; the wind blew from the south-west; and in the afternoon it was thawing. I had already observed at the Athabasca that this wind never failed to bring us clear, mild weather, whereas when it blew from the opposite quarter it produced snow. * * * To this cause may be attributed *the scarcity of snow* in this part of the world. At the

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end of January very little snow was on the ground; but about this time the cold became very severe; and remained so to the 16th of March, when the weather became mild, and by the 5th of April all the snow was gone."

Such is winter on the upper parts of the basin of the Mackenzie. Now as to their genial season. Writing of the 2nd day of April on the River Peace, Captain Butler says on page 195 of his "Wild North Land":

"April had come: already the sun shone warmly in the mid-day hours; already the streams were beginning to furrow the grey overhanging hills, from whose southern sides the snow had vanished, save where in a ravine or hollow it lay deep-drifted by the winter wind."

On page 215 of his book, Butler says of the banks of the Peace:

"It was only the second week in April, and already the earth began to soften; the forest smelt of last year's leaves and of this year's *buds*. * * * During the whole of the second week in April the days were soft and warm, rain fell in occasional showers; at daybreak my thermometer showed only 3° or 4° of frost, and in the afternoon stood at 50° or 60° in the shade. * * * With bud and sun and shower came (page 246) the first mosquito on this same 20th of April. * * Have looked (page 356) from the ramparts of Quebec on the second last day of April and seen the wild landscape still white with the winter snow."

In his Report of 1874 to the Canadian Government, Mr. Macoun, a Professor of Botany, writes of the Valley of the Peace:

"While we were passing through it, the constant record was 'warm sunshine, west winds, balmy atmosphere and skies of the brightest blue.' Even as late as the 15th of October, the thermometer was 48° at daylight and 61° in the shade at noon. Within the foothills of the Rocky Mountains I picked up three species of plants in flower as late as the 26th of the same month. These facts, and many others that could be cited, show conclusively that there is an open fall, and the united testimony of the residents make it clear that the spring commences before the 1st of May. There must likewise be a warm summer, as the service berries (*Amelanchier Canadensis*) were gathered fully ripe as early as the 15th of July last year by the miner we engaged at Edmonton; same berries ripening at Belleville (Ontario) about the 10th of the same month."

Macoun says further:

"Captain Butler, in his 'Wild North Land,' speaks of the whole hillside of St. John's (on the Peace) being blue with anemones (*Anemone Patens*) as early as April 22nd (1873), and Sir Alexander Mackenzie records in his journal that anemones were in flower on the 20th of April (1793). From the Hudson Bay Company's journal, I found that the average opening of the river in 10 years at St. John's was on the 20th of April. The year Captain Butler was there, it opened on the 23rd, and the year Sir Alexander Mackenzie was on it, on the 25th. These dates show that the spring is just as regular as the fall, and that the beginning of winter and the opening of spring are unvarying. * * * The setting in of winter and the end of the ploughing season is, at least, eight days *later* than at Winnipeg."

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In the Geological Report for 1875–6 (page 156) Mr. Macoun says in reference to the Hudson's Bay Company's Journal kept at St. John's:

"A careful examination of the extracts referred to will shew that from the middle of April until the first week in November the ground is fit for the plough; that winter is actually shorter on Peace River than in Manitoba, and that 200 miles north-west of Fort Garry a milder temperature prevails in autumn than at that point. On the 2nd of November, 1875, I found the Assinaboine frozen solid at Winnipeg, so that I could walk across it, while from the Peace River record ice has been seen in the river as early as that only once in ten years."

The climate of the upper parts of the basin of the Mackenzie having been glanced at, now for a brief review of their soils. Of the country traversed by the River Peace, Sir Alexander Mackenzie says in his "Voyages" (page 129):

"There is not the least doubt but that the soil would be very productive, if proper attention was given to its preparation. * * The soil is black and light."

Dr. King states in answers 5645–7 to the Parliamentary Committee of 1857 that:

"Sir John Franklin, Ross Cox, and many others, speak of the richness of that part of the country. * * That tract is a rich soil. * * It was a black mould which ran through the country, evidently alluvial soil"

In his "Wild North Land," Captain Butler says on pages 194 and 256:

"The soil is a dark sandy loam, * * the fertile nature of the country between Lesser Slave Lake and the Rocky Mountains, etc."

Professor Macoun says in his Reports of 1874 and 1877 on the soils of the upper parts of the Valley of the Mackenzie:

"The whole country seen or heard of throughout the region in question is covered with a deep, rich soil, of wonderful fertility, free from boulders, and having very few swamps or marshes." * *

"The soil examined was of the very best description, being evidently alluvium. * *

"Regarding the quality of the soil throughout the entire region, my note-book is unvarying in its testimony. I took every opportunity to examine the soil, and always found it deep and fertile. It was principally clay-loam; but had much the appearance of the *intervale* lands along streams in Ontario. Its average depth where sections were exposed was five feet; but, owing to the clay-subsoil, it was practically inexhaustible. Days would elapse without seeing a stone, except in the beds of the streams, and swamps were unknown in the level country along Peace River."

The climate and soil in the region under consideration may be shown in actual result by a review of its growth. In answers 5633 to 5660, Dr. King—who was, be it repeated, the naturalist of the Ross and also of the Back expeditions—says of that region to the Parliamentary Committee of 1857:

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"The birch, the beech, the maple, are in abundance, and there is every sort of fruit, there is likewise barley."

"That tract is a rich soil interspersed with well-wooded country, with a growth of every kind, and the whole vegetable kingdom alive."

"The trees were very vast and splendid in their growth. * * They are like the magnificent trees around Kensington Park, and would bear comparison with anything of the kind."

Sir Alexander Mackenzie, speaking of upper parts of the Mackenzie Basin, says (pp. 86, 87, 129, 163, 169) in his "Voyages":

"From thence the eye looks on the course of the Little River * * beautifully meandering for upwards of 30 miles. The valley, which is at once refreshed and adorned by it, is about three miles in breadth, and is confined by two lofty ridges of equal height, displaying a most delightful intermixture of wood and lawn, and stretching on till the blue mist obscures the prospect. Some parts of the inclining heights are covered with stately forests relieved by promontaries of the finest verdure where the elk and buffalo find pastures." * *

"Opposite the present elevation" (on the Peace) "are beautiful meadows with various wild animals grazing upon them, and groves of poplars irregularly scattered over them. * * Groves of poplar vary the scene and their intervals are enlivened with herds of elks and buffalos. * * The whole country displayed an exuberant verdure, the trees that bear a blossom were advancing fast to that delightful appearance. * * The east side of the river consists of a range of high land covered with white spruce and the soft birch, while the banks abound with alder and willows." * *

"The country is so crowded with animals" (a proof of its richness) "as to have the appearance, in some places, of a stall-yard, from the state of the ground and the quantity of dung that is scattered over it." * *

"After we had travelled for some hours through the forest, which consisted of spruce, birch and the *largest poplars I had ever seen*, etc."

McLeod's Voyage of Simpson supplies the following reference to the upper valley of the Mackenzie in note xxxiv.:

"We reached Methy Lake, near the middle of which, on a long projecting point, we encamped among *firs of great size.* * * From the hills on the north side, a thousand feet in height, we obtained that noble view of the Clearwater River which was drawn with so much truth and beauty by Sir George Back. * * One of the pines under which we took our night's lodging, measured three yards in girth five feet from the ground."

In his "Wild North Land," Captain Butler says (pp. 122, 123, 183, and 235) that when he had passed from the Valley of the Saskatchewan into that of the Athabasca, a tributary of the Mackenzie:

"The aspect of the country had undergone a complete change, the dwarf and rugged forest had given place to lofty trees, and the white spruce from a trunk of eight feet in circumference lifted its head full one huudred and fifty feet above the ground."

"A river" (the lower part of the Athabasca) "high-shored and many-islanded, with long reaches leagues in length, and lower banks wooded with large forest trees."

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On page 187, Captain Butler speaks of—

"The beautiful region of varied prairie and forest land which lies at the base of the mountains between the Peace and the Athabasca River."

On page 235 Butler says of another part of the territory under review:

"A terraced land of rich-rolling prairies, * * a park-like land of wood and glade and meadow, where the jumping deer glanced through the dry grass and trees."

The region under review here is truly what it has been called by Captain Butler, a "lone land." Except at a few posts of the Hudson's Bay Company and a few Missionary Stations, it is a solitude. Actual production within its limits cannot be cited in many instances; but the following may be sufficient to show the general adaptation of the upper parts of the Valley of the Mackenzie to gardening and farming:

Fort Norman, lat. 64° 31′. In answer 247 to the Parliamentary Committee of 1847, Col. Lefroy says that barley may be grown at Fort Norman. In answers 2562–5, Mr. Isbister says that when stationed at Fort Norman he grew barley and potatoes.

Fort Simpson, lat. 61° 5′. Sir John Richardson says, in answer 3124, to the Parliamentary Committee of 1857, that at Fort Simpson they rear cattle and cultivate barley. Col. Lefroy states, in answer 246, that at Fort Simpson there are regular crops of barley, regular cattle and a good garden. Barley, he adds, grows very well indeed. Dr. Rae says in answer 391, that barley is grown at this Fort; and Professor Macoun in his report of 1877, cites Mr. Chief Factor Hardisty as his authority for saying that at Fort Simpson barley always ripens, and wheat four times out of five.

Liard River, lat. 61°. In answer 2572 to the Parliamentary Committee of 1857, Mr. Isbister says that wheat can be grown at Fort Liard, but cannot be depended on. In answer 2649, he adds: "On the Liard you can raise large crops." In answer 391 Dr. Rae states barley is grown at Fort Liard. Professor Macoun says in his report of 1877, that Chief Trader Macdougall asserts that all sorts of grain and "garden stuff" always come to maturity on the Liard.

Fort Chippewayan, lat. 58° 42′. In his report for 1877 Professor Macoun says that scarcely anything is done with the soil at Fort Chippewayan until after the 10th of May, and often barley is sown after the 1st of June and comes to maturity. He states that he obtained fine samples of wheat and barley grown at this Fort—the wheat weighing 68 lbs. to the bushel; the oats 58 lbs. He says he obtained there:

"Specimens of wheat and barley which have astonished all parties to whom I have exhibited them. Many of the ears contained one hundred grains; and the weight of both wheat and barley was nearly ten lbs. over the ordinary weight per bushel. These grains had been raised on soil comparatively poor—very poor for the district—and lying only a few feet above the level of Lake Athabasca."

Little Red River, on the Peace, lat. 58° 30′. Professor Macoun states that on the 15th of August (Report for 1877) "cucumbers started in the open air at this place were fully ripe, and that Windsor and pole beans, cabbage, turnips, were likewise ripe; potatoes and cucumbers were first class."

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VERMILLION RIVER, on the Peace, lat. 58° 24′. Professor Macoun's report for 1877 cites Mr. Shaw, a Hudson's Bay Company's officer, as authority for the statement that every kind of "garden stuff" can be grown here. * * Barley sown on the 8th of May was cut on the sixth of August; and was, says the Professor, "the finest I ever saw. Many ears were as long as my hand; and the whole crop was thick and stout."

In the Geological Report for 1875–6 (page 161) Macoun says further of Vermillion:

"Although 2° farther north than either Dunvegan or St. John, the barley and vegetables were much farther advanced. Barley was standing in stocks in the field, having been cut on the 6th of August, while scattered ears of wheat which I found around the fence were fully ripe (August the 12th). * * The barley was sown on the 8th of May and reaped on the 6th of August, having been in the ground just 90 days. The heads averaged from 4 to 6 inches in length and were full of large grains of a beautiful color. In fact both wheat and barley were the plumpest I ever saw; and must weigh as much as that brought from Chippewayan. They stood very thick in the ground and were uncommonly stout and must have yielded very heavily. Turnips and early rose potatoes were quite large and both gave indications of a heavy crop."

BATTLE RIVER, on the Peace, lat. 58°. Professor Macoun says that at this point (300 miles lower down the Peace than St. John's, and therefore about lat. 58°) Indian corn has ripened three years in succession.

FORT ATHABASCA, on the Athabasca, lat. 56° 40′. On page 129 of his "Voyages," Sir Alexander Mackenzie writes: "When first I arrived at Athabasca, Mr. Pond was settled on the banks of the Elk River" (Athabasca River) "where he remained for three years, and had formed as fine a kitchen garden as I ever saw in Canada." In answer 181 to the Parliamentary Committee, Col. Lefroy says: "Most vegetables or anything requiring a short summer will grow at Athabasca very well."

In his Report of 1876, Professor Macoun writes of this Fort:

"Mr. Moberly, the officer in charge of Hudson's Bay Post at this place, states that his wheat and barley were superb, and that the country round the Forks was well suited for farming purposes. About a mile above the Forks, on the Clear Water, is a beautiful prairie on which great quantities of hay were cut with a reaper. The Hudson's Bay Company could raise enough wheat here to supply the demands of all their Posts in the North."

ST. JOHN'S, on the Peace, lat. 56° 15′. Professor Macoun states in his report for 1877, that "Dan Williams had oats, barley and potatoes growing at St. John's when I was there. The latter he dug on the 2nd August, and they were large and dry; the two former were fit to be cut about the 12th of the same month."

In the Geological Report of 1875–6 Macoun says further of St. John's that on the 9th of August, barley was ripe with grain large and full, and that vegetables were also in an advanced state.

HUDSON'S HOPE (latitude 56°.) In his Report of 1876, Professor Macoun says of this place:

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"Wild peas and vetches grow to an amazing height; vetches, roses, willows, herbs and grasses of Genera, *Poa*, *Triticum*, and *Bromus*, have almost tropical luxuriance. Potatoes, onions, turnips, carrots, cabbage and other vegetables grow in the gardens; and at this date" (the 2nd of July) "potatoes planted 28th of April were of very fair size and fit for use."

Isle La Crosse, lat. 55° 30′. In note xxxvi. of Mr. McLeod's "Peace River," Simpson says of this place: "The little farm is productive, and the few domestic cattle maintained were in excellent condition." Mr. McLean says: "This post is surrounded by cultivated fields." Colonel Lefroy states of this place, in answer 246 to the Parliamentary Committee of 1857, that 10 acres were cultivated, yielding barley. In his report for 1877 Macoun says of this Fort, that all kinds of grain are reported as ripening successfully. Sir Alexander Mackenzie (page 81) writes: "Except a small garden at Isle La Crosse, which well repaid the labour bestowed upon it." Macoun states on page 179 of the Geological Report of 1875-6: "All kinds of vegetables grow well, and turnips, potatoes, carrots and cabbage were of large size. Wheat, barley and oats succeed well; but the former is not considered a sure crop, although the frost never injures anything."

Little Slave Lake, lat. 55° 15′. In his report for 1877 Macoun says he found barley in stack at this place on the 12th of August.

Lac La Biche, lat. 54° 45′. Captain Butler speaks of this place in his "Wild North Land" (page 358), as "a French mission, where all crops have been most successfully cultivated for many years." Professor Macoun says of this station in his report for 1877: "The Indians and Half-breeds raise an abundance of wheat and other cereals, together with enormous crops of potatoes and garden vegetables. The missionaries raise excellent crops of wheat and other cereals."

The specifications of production at the thirteen places named in the foregoing summary apply at great distances apart. They include an area embracing ten degrees of latitude and thirteen degrees of longitude. The region to which these and the other facts of production and climate apply is described by Simpson (note xxviii. of McLeod's "Peace River"), as:

"Extending from Clearwater or Methy Lake to the Leather Pass (*Passa de la Cache de la Tete Jaune*), and the Rocky Mountain Portage, or Columbia Pass, or Boat encampment. * * In extent it is about five hundred miles from east to west, and two hundred from north to south, say eighty thousand square miles; and is the *very Eden of our North*."

In answer 541 to the Parliamentary Committee of 1857 Dr. King describes thus the limits of the region covered by his answers as to its soil and production:

"It is bounded on the south by Cumberland House on the Saskatchewan; it is an enormous tract of country. * * Then it is bounded by the Athabasca Lake on the north. This large portion which I describe as within this area, I looked upon as the most fertile portion which I saw."

Mr. Horetzky says, in his "Canada on the Pacific" (pp. 229 and 232):

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"On proceeding a little to the north and on gaining the water-shed of the Peace River, a decided change is at once perceptible, not only in the appearance of the country, but also in the climate. * * Within an area bounded by the Smoky River, the Rocky Mountains, and the parallel of 56½° north latitude there lies *the future garden of the West*, now lying fallow, but yet gorgeous with many of the choicest prairie flowers, and replete with the finest wild fruits peculiar to both wood and plain. Beneath its serene sky the lovely hills and dales, with many crystal mountain-fed rivulets between, afford *the choicest soil on the Continent*, from which the husbandman will, eventually, extract with ease abundant harvests."

The evidence is conclusive that there exists within the basin of the Mackenzie, a vast tract of extraordinary richness. Its southern boundary running near the parallel of 54½ degrees of latitude, its northern boundary may be held to run near that of 59½°. Its western limit passing transversely from the 122° of longitude to the 120°, its eastern may be said to follow the 111°. An area of about 350 miles by 400 miles—double that of England and Wales—may, therefore, be set down on a considerable breadth of testimony, as offering, under exceptionally favorable circumstances of drainage, wood, water, climate, a high proportion of the whole surface in soils unsurpassed on the Continent of America. One-half of the agricultural wealth of the Canadian North-West seems to be situated there in a compact form, and accessible throughout all its parts by means of a network of natural highways of settlement—river courses—which cannot be found in that North-West elsewhere. Navigation by steam is in actual operation to-day for about 300 miles on one of these water-ways —the Athabasca—along this region's eastern edge ; and on another—the Peace—zig-zagging across it for seven hundred or eight hundred miles. Each of these two great channels is the artery of a river-system, some of whose parts are themselves arteries. One of the latter, the Rouge, is as large as the Thames ; and another, the Smokey, supplies outfall for several smaller water-ways whose lengths aggregate some hundreds of miles. Lying on the threshold of a gateway through the Rocky Mountains which offers access to the Pacific Ocean *on the line of lowest level*, and at such a distance from the Atlantic terminus of the trans-continental railway that every acre of it put into production will contribute the highest possible amount to the traffic-receipts, that vast and rich and finely-watered region on the way to the whale-fields at the mouth of the Mackenzie, declares that one point on the proper route of the Railway is determined, *prima facie*, by Peace River Pass, or its alternative, Pine River Pass.

Portland in the State of Maine is, at present, the winter outlet of all the Ocean Commerce of Canada, west of Montreal. So long and so far as Montreal is the terminus of the inland carrying-trade of the Dominion, so long and so far will that harbor of the United States—Portland—hold excluded by virtue of prohibitory differences in length of transportation, the Canadian ports of St. John

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and Halifax from the enjoyment of the commerce of the Canadian Provinces west of Quebec. The selection of the terminus of the Pacific Railway upon the St. Lawrence settles the question whether that state of things is to continue for ever. If subordination in that instance to a foreign power is to be stopped at all, the stoppage must be made by locating with an eye to its winter-outlet on the Atlantic, the arterial channel of the Canadian *future*. Halifax and St. John offering alternatives for that escape from dependence, sound policy demands that the terminus of the Pacific Railway on the St. Lawrence shall be planted on the most easterly point at which that River can be bridged—at or near the City of Quebec. That place is, it is true, about forty miles farther on a straight line than Montreal is from Peace or Pine Pass; but it is, on the other hand, nearer to St. John by about 90 miles, nearer to Halifax by a railway-distance of 150 miles on one route and of 170 miles on the other. Placed at Quebec, a terminus of the great Canadian highway would be somewhat nearer by railway to the Atlantic at St. John, New Brunswick, than if placed at Montreal, it would be to the Atlantic at Portland, in Maine. It would not only be nearer than Montreal to Halifax by from 150 to 170 miles; but it would force the construction of a chord-line across the bow of the Intercolonial; and reducing a length of transportation that is now prohibitory, forty per cent., would enable Halifax to transact Atlantic business of the trans-continental railway by virtue of her geographical advantages. And Quebec being a position where strength of defence on land may obtain the co-operation of ships requiring such depth and room as iron-clads, that city may be regarded on all hands as the true place for the terminus of the Canadian Pacific Railway upon summer tide-water.

If Quebec be made one point on the great British American highway, and Peace Pass, or Pine Pass, another, the present route must be abandoned *in toto*. Involving an unnecessary length of track to the extent of over 300 miles,* it is excluded by the resulting excess of running expenses and maintenance, in favor of a direct route. The latter would drop from the "broken" country back of the city of Quebec into the valley of the St. Maurice. Following that stream, it would next pass into the rain-basin of Hudson's Bay at an elevation of about 1,400 feet above the sea; and then descend to the River Moose, with a view to connection without any considerable increase of track-length, with navigation from Hudson's Bay. Proceeding, tapping on its way the rivers Albany, Equam, Weemisk, Deer, Severn, Wastickwa, &c., it would tap the navigation of Lake Winnipeg on the south and of the rivers Hayes and Nelson on the

* A difference of 240 miles mentioned in a former pamphlet on this subject is taken to apply to the adopted route. It was stated in the sense of a comparison of the proposed route with a route diverging on the line of Mr. Marcus Smith from the adopted route at Winnepeg, to Pine Pass.

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north, at the outlet of Lake Winnipeg, crossing that outlet* where it is said to be but 200 yards wide—at Norway House. Continuing westwardly, further deviations from the straight line at the suggestion of great general considerations, would take this route to, say, Big Bend, so as to tap the navigation of the Saskatchewan-system—navigation good for two or three months of the year—above the Grand Rapid. Proceeding into the basin of the River *Lac la Ronge*, it would go up the valley of the Beaver; and, tapping the River Athabasca, tap the Peace, and tap the Smoky, and tap the Pine, on its way westwardly through the Rocky Mountains.

The line of lowest level between the rain-basin of the Northern Ocean and of the Pacific lies by way of the River Peace, Lake MacLeod and the River Fraser. It crosses the "Continental summit" on Giscomb Portage, at an altitude above the sea of 1950 feet. From this, another line of low level may be traced to the Pacific. Diverging from the last somewhat south of Giscomb Portage, it proceeds up the Nechaco; and going on by way of Lake Fraser, the Rivers Itanquah, Watsonquah and Skeena, to tidewater, never reaches an altitude higher than 2,400 feet. Still another line of low level diverges from this one. At the junction of the 54th parallel with the 124th meridian, it trends south of west at an angle of about 45 degrees with the meridian, until it reaches the valley of Salmon River. Following that valley to Kamsquot it arrives at tidewater without having ascended higher above the sea than 3,100 feet. These three lines are the lowest known, are almost certainly the lowest obtainable, for crossing from the plains to the Pacific†—the highest summit on the first being lower than Yellow Head Pass by 1900 feet; that on the second being lower than Yellow Head Pass by 1300 feet; that on the third being lower than Yellow Head Pass by 700 feet.

The routes just traced across the central plateau of British Columbia adhere to the water courses. The circuits which that involves exclude the first of these low lines on the ground of excessive length. The mileage of the other two may be reduced very considerably by an application of even present information About half a degree south of the pass of the River Peace is a gap in the Rockies—at the source of the River Pine—having an altitude of 2440 feet. A "short-cut" may be made between points on the lines of low level which have been designated here, by crossing the Mountains at that pass; and going on thence by way of Lake MacLeod and Fort James, into the valley of the Nechaco. A trail along that line has been explored;

* Like all other details of the proposed route, this is stated simply as a basis of enquiry. The particular crossing suggested may be utterly impracticable; indeed, Dr. Bell's recent map presents no width so narrow as 200 yards.

† This is not intended to apply against the presumptions of topography that a low-level crossing exists over the Continental summit dividing the waters of the Finlay from those of the Skeena at the source of the Nasse.

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and gives one summit of 2620 feet and another of 2990; but offers otherwise a surface not highly difficult where it is not even positively favorable.

But trails are adopted because of their facilities for travelling, rather than for their low-levels. That referred to here is known to be in some parts higher than the surrounding country. There is reason for supposing that gaps may be discovered by sectionings along the transverse ridges, reducing the highest altitude of the "short-cut" to 2500 or 2600 feet. But be that as it may, known facts leave no doubt that two routes from the gap at the source of the River Pine can be obtained from the summit of the Rockies to the sea, that to Port Simpson being of about the same length as the route adopted from the summit of the Rockies to Port Moody on Burrard Inlet; that to Kamsquot Bay, on Dean Inlet, being about 180 miles shorter. On the first of these two low-level lines—that to Port Simpson—the aggregâte length involving excessively heavy works is so much less a proportion of the whole than in the case of the line from Yellow Head to Burrard Inlet, the cost of construction would be decidedly less. But waiving the proportion of that saving common to the two low-level lines under review here, the saving on the line from Pine Pass to Dean Inlet, compared with the line from Yellow Head to Burrard Inlet, would be, by virtue of the reduction of the distance alone, 35 per cent.—ten to fifteen millions of dollars.

The harbor-question has received in the consideration of route across British Columbia an importance beyond what it seems to be entitled to on its merits. Port Simpson may, however, be set down apart from that consideration as the best harbour on the mainland of British Columbia; and no one who understands questions of transportation practically, will entertain for a moment the folly of an alternative on Vancouver's Island. Dean Inlet is open, as all harbors are, to more or less objection by sailors; but that will disappear, no doubt, as it has in the case of other harbors offering freights, when shipping shall have found business on the two miles of deep-water-front at Kamsquot. If the commerce of the Pacific should be attracted in any great extent to the highway across British America, that result will certainly be one of slow growth. Inasmuch as the land necessary for transacting the business incident to all that is likely to offer for a quarter of a century, can be obtained at Kamsqout; and inasmuch, further, as water-accommodation can be found for it on the two-mile-front of Kamsquot, the question arises whether looking beyond the next twenty-five years is quite wise at the cost of a present unnecessary outlay of nine or ten millions. About two hundred miles of the line from Pine Pass to Kamsqout is common to the line from that Pass to Port Simpson; and the abandonment of the 160 miles of extension from the divergence of the two to Dean Inlet, would be the ultimate cost of saving that expenditure now, until the

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time shall have come to demand the superior advantages of Port Simpson. If there be any overruling reason for beginning the work on the Pacific in anticipation of the regular course of extension from the "paying" part of the route, in anticipation of the regular course of the project as a developer of the country "paying its way" through the lands it opens up, every consideration of practical expediency demands that that work shall be begun on the Pacific at the point offering the cheapest and the shortest line between tide-water and tide-water—Kamsquot Bay.

The substitute for the adopted route having been followed out from the St. Lawrence to the Pacific, a review of its merits may be entered on now. In the Woodland Region the country along the new line is, however, still so completely under the veil of misapprehension which had been drawn by the Hudson's Bay Company over the whole region of the North and North-West, that it must be made, in the first place, a subject of special review.

For 60 miles out from Quebec, the proposed route crosses the general direction of the water-courses. About 25 miles of that distance lie through vallies; but the remainder pursues rolling surfaces involving works somewhat heavy. At the end of that section of 60 miles, it enters the basin of the St. Maurice. On the faith of a report made by Mr. John Bignell, a Provincial Land-Surveyor, to the Crown Lands Office (Appendix W. W. Journal of the Legislative Assembly of Canada 1850) the line may be said to enjoy from that point to the height of land, at the cost of perhaps a few crossings of the stream, all the advantages of the uniform surface found ordinarily along a river. The crossing of "the height of land" may be supposed to present but little difficulty. Mr. Richardson states on page 300 of the Geological Report of 1872:

"Following the St. Maurice upward to the upper end of Lake Traverse, the country is comparatively level, and the river for considerable distances winds through extensive flats. * * * In ascending the Clearwater River, a tributary of the St. Maurice, to the height of land, the country bears the same level character."

At the end of about 275 miles the proposed route enters the basin of Hudson's Bay. For 1100 miles, to Norway House, it runs within that basin and through what has been known to the officers of the Hudson's Bay Company as "the level clay country of the North." A map published by the Pacific Railway-service describes 400 miles of that region—between the Harricanaw and the Albany—as a "flat country;" describes 500 miles more of it—between the Albany and the Nelson—as, by report, a "level country." These facts are good in general for the conclusion that the route from the head of the St. Maurice to Norway House offers a topography exceptionally favorable.

Special information corroborates the general conclusion just laid down. The country under review here has been visited by explorers

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at several points between Lake Mistassini and the River Nelson. At the former of these, it is described by Mr. Richardson (Geological Report of 1871, page 302) in these words:

"Northward to the bays of Lake Mistassini, the country is a level plain. * * The surface is level, in no place that I observed rising more than 30 feet above the Lake."

Lake Abittibi is another point at which special light has been thrown on the topography of that country. In the Geological Report of 1872-3, Mr. McOuat says (page 134):

"The whole region examined" (from the height of land, at the head of Lonely River, a tributary of Lake Temiscamingue, to a point 7 miles below the outflow of the Abittibi River from the Lake) "may be pretty correctly described as a level clay plain with a great number of rocky hills and ridges protruding through it. * * On the lower levels, a good deal of the surface is probably swampy. * * Lake Abittibi is surrounded on every side by level clay land. * * To the north, and especially to the north-westward, the clay level seems almost unbroken, and it is well known that it extends in this direction to the shores of Hudson Bay."

Of the country below Abittibi Lake we learn the following from Dr. Bell's statement on page 359 of the Geological Report for 1877-8. Speaking of the River Abittibi, upwards from James' Bay to the lake, he says:

"The first and lowest section flows through a level country. * * In the second" (45 miles long) "the River runs in a narrow valley with a clayey bottom and rocky hills varying from 50 to 200 feet; but averaging 100 feet in height on each side. No high ground was observed near the River throughout the rest of its upward course except at the Duck River Rapids and at a bend nineteen miles in a straight line from the outlet of Abittibi Lake, where hills rise on either side to a height of 80 and 120 feet respectively."

From the height of land at the source of the Michipicotan—a tributary of Lake Superior—an exploration has penetrated the region under review by way of the Missinaibi and the Moose. At about 85 miles up the Moose from Moose Factory is Long Portage. Dr. Bell says (Geological Report of 1875-6, page 310):

"From the foot of Long Portage to the sea the river runs through a level region. * * Between the great lakes and James Bay the country is of a very different character in each of the two geological areas which it embraces. * * The former is somewhat elevated, undulating, and dotted with lakes, while the latter is low and swampy, and, as far as known, free from lakes."

From Long Lake House, near Lake Superior, the River Kenogami flows northwardly into the Albany. In reference to that stream and two others on the same route, Dr. Bell says on pages 340-3 of the Geological Report of 1870-1:

"English or Kenogami river flows through a level country all the way from Long Lake to the Albany. * * The whole country explored in connection with the Manitou-Namig and Ka-wa kash-ka-ga-ua rivers is

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comparatively level. As illustrating the general level nature of a portion of this region, I may refer to the fact that we did not find it necessary to make a single portage on going all the way from English River to Head Lake, except the short one already mentioned."

Of a line from the head-water of the Ombabika River, on the height of land north of Lake Nepigon, Dr. Bell says in the Geological Report of 1871-2, pages 107-8 :

"We left Ogoke River * * and crossed the height of land which separates its waters from another tributary of the Albany lying farther north (the Ka-ge i-na-gami). * * Following this tributary northward, we reached the Albany at a lake called Abazotikitchewan. * * By the canoe route which we surveyed the distance is 142 miles. * * * The country traversed by this route presents a generally level aspect; but the surface is rocky or swampy as far as we could examine it. * * Some sections are hilly, but the highest point seldom rises more than 50 or 60 feet above the general level."

Speaking of the Albany between Makobatan Lake and Martin's Falls, a distance of 56 miles, Dr. Bell says on page 110 of the Geological Report of 1871-2 :

"The surface of the country on either side of this section of the river appears to be only slightly undulating. * * All the country around Lake Makobaten is so level that, &c."

Applying to a stretch of 100 miles along the Albany, Dr. Bell says, in the Geological Report for 1871-2 (page 111) :

"All the way from Martin's Falls to the junction of the Forks" (junction of the Kenogami) "the Albany is flanked by steep banks, either immediately overlooking the water or rising a short distance back from it. In descending the River their general height increases gradually from forty to about ninety feet. * * The country on either side of the Albany below Martin's Falls is quite level."

The topography of the region under review having been glanced at on the east and at the centre, now for some light as to its character at the western end.

In the Geological Report for 1877-8, Dr. Bell says (page 13 c.c.) :

"The region through which the upper two-thirds of the Nelson River flows may be described as a tolerably even Laurentian plain, sloping towards the sea at the rate of about two feet in the mile."

On pages 17-18 of the same report, the same authority states that :

"The general aspect of the country along the upper part of the Nelson River is even or slightly undulating, the highest points seldom rising more than thirty or forty feet above the general level. Whiskey Jack 'Mountain,' opposite the foot of Sea river-falls, is only from thirty to sixty feet high. The 'High Rock,' four miles above the entrance to the Echimamish, has an elevation of only about 50 feet. Such terms applied by the inhabitants to mere banks and hummocks indicate the general level nature of the country."

The general and the special evidence given above covers expressly several great stretches of the region under review. But the country is so vast in extent that that evidence falls far short of the whole

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field. A still wider breadth of reading than what has been given above shows that it contains many swamps, some small, some large, some very large. While these are known to exist chiefly in the valley of the River Albany and on the southern shore of James Bay, the retentive character of the soil overlying the rock-base, points to the supposition that swamps occur to a considerable extent in other parts of the region. Subject to these facts and probabilities, there is in the foregoing citations, good ground for the general conclusion that a stretch of country so vast as that between the St. Maurice and the Nelson, can be found in but very few cases on the Continent of America so highly favorable topographically to the construction of a railway.

Turn now to the question of soil. Along the line of the Quebec and St. John Railway as far as La Tuque on the St. Maurice, the region traversed by the proposed route of the Pacific Railway presents some fine soils. The Townships of Gosford and Rockmount on the St. Anne, tell that story for themselves in the agricultural returns of the Census. The map accompanying the Quebec and St. John Railway-report, declares the land traversed by that line to the St. Maurice to be, on one branch of the Batiscan "good," and on the other branch of that River, "excellent." To the north of the junction of the proposed route with the St. Maurice, one of the best tracts in Quebec extends for fifty miles up the Croche; and thence for twenty more down a stream discharging into Lake St. John. The report of the Quebec and St. John Railway is the authority for these statements. But the country on Lake St. John is declared to contain not only first-class lands, but to contain them to the extent of a score of settled townships, by the returns of the Census.

Mr. Bignell's report on the St. Maurice has been cited in the foregoing. It says:

"On ascending the river * * the soil is in some places pretty good, although not rich enough to offer inducements to settlements at such a distance. * * In other places, the banks are low and level, the soil light, but rich with alluvial deposit. * * The country on the St. Maurice above the Hudson Bay Company's post at Weymontachingue is generally poor soil, light and sandy; in some places rocky, mountainous and barren; the vallies of the tributaries, however, present a better soil, which is loamy and fit for culture."

One tributary of the St. Maurice, which has been referred to already, is described in a report of M. Dumais to the Crown Lands Office, as, "the beautiful and fertile valley of the Croche." Of other tributaries of the same River, Mr. Bignell says:

"The soil for a distance of 28 miles from the mouth" (of the North Bostonnais) "is generally good clay, sand and loam being alternately found. * * The soil at the mouth" (of the Vermillion) "is sand and loam, in many places being indifferent and in others exceedingly good. * * From my own observation, and from information received from

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Messrs. Vassal & Comeau, to whom the whole country is well known, I should pronounce the rivers Vermillion, Croche and Ice Chisel superior to what the Ottawa ever was."

The last foregoing statement may apply, not in direct reference to the soil, but to the timber. M. Dumais includes one of the tributaries of the Saguenay with four of the St. Maurice, when he says in his report to the Crown Lands Office :

The Vallies of the Ouiatchouan, Bostonnais, Batiscan, Little Bostonnais and the Croche, which I have explored, contain nearly a million of acres of arable land."

Mr. Russell, who has had an extensive experience in the country under review here, says, on page 107 of his book, that the arable land in the basin of the St. Maurice "has been roughly estimated at upwards of 5,000 square miles"—that is to say, over three millions of acres.

Beyond the sources of the St. Maurice the route proposed enters what the Hudson's Bay Company's officers call "the level clay country of the north." From the Harricanaw to the Albany—a distance of 400 miles—it is described on a map published by the Pacific Railway-service as "loam and clay of good quality." From the Albany to the Nelson—a distance of 500 miles—it is said by that map to be "alluvial soil." These general statements are corroborated by a considerable breadth of special cases.

On pages 302-3 of the Geological Report of 1870-1, Mr. Richardson says as to the country near Lake Mistassini :

"Lake Wakanitche * * the soil is sandy loam, well fitted for agriculture. * * As before mentioned the country soon after leaving Wakanitche" (going on to Lake Mistassini) "is underlaid by comparatively flat limestone strata, the decomposition of which gives a fertile, calcareous soil. The surface * * thus rendering the region favorable for agriculture."

Mr. Russell says on page 10 of his book:

"The clay-lands of the Hudson's Bay extend south of Lake Abittibi to the northward of the waters of the Ottawa."

In the Geological Report for 1872-3, Mr. McOuat says on page 134 :

"Lake Abittibi is surrounded on all sides by level clay land. * * To the north, and especially the north-westward, the clay level seems almost unbroken, and it is well known that it extends in this direction to the shores of Hudson's Bay. Several acres of this clay soil are cultivated at the Hudson's Bay Company's post at Abittibi and with satisfactory results."

Of the lands on the lower stretch of the River Abittibi, Dr. Bell says on pages 35 and 37 of the Geological Report of 1877-8 that:

"They are overspread with an even covering of drift and the banks of the River * * consist of boulder-clay overlaid by more or less sand or gravel and brownish loamy and gravelly earth. * * Drift clays similar to those of the main Moose River extend up the Abittibi as far as the Sextant Rapids, at the end of the first stretch."

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Dr. Bell writes on page 24 c. of the Geological Report of 1877-8:

"Along the east side of James' Bay from the vicinity of Rupert's House to Cape Jones," (lat. 55°) "there is a strip of country averaging, perhaps, 20 or 30 miles in width from the sea-shore which, from all that I could learn from others or observe myself, appears as if it might some day have a certain agricultural value. Viewed from the Bay, it has a gently undulating aspect. * * The soil is generally sandy, often underlaid by stratified greyish clays which occasionally come to the surface."

On pages 7 and 8 of the Geological Report of 1877-8 that intrepid explorer, Dr. Bell, says:

But after passing the "swampy grounds" north of Missinaibi Lake, the traveller cannot fail to be struck by the abundance and the general fertility of the soil exposed on the banks of the Missinaibi and the Moose Rivers all the way to Moose Factory. * * I examined the country for a mile or two back of the River in several places for the special purpose of ascertaining the nature of the soil, and found it excellent in all cases, but tending to become more swampy in receding from the River in the region below the Long Portage. * * The example of the farms at New Brunswick House and Moose Factory shows upon a small scale what might be extended over a great part of the country. I have no doubt that at some future time this territory will support a large population."

Dr. Bell writes thus (page 310) in the Geological Report of 1875-6:

"The land immediately above the banks of the river" (Missinaibi-Moose) "is dry, * * but at a short distance back was always found to be swampy. The islands and mainland about the mouth of the river consist of alluvial earth well suited for cultivation. * * I think the proportion of the whole area in which the rocks are exposed is much less than is commonly supposed. This opinion is formed after having examined it in hundreds of places throughout an area of 200,000 square miles between the Ottawa River and Lake Winnipeg. * * * Loose materials of some kind actually covers the greater proportion of the area, and in a very considerable percentage of it the soil is more or less suited to agriculture. * * As to the area within the palæzoic basin of James' Bay, a too level character of the surface will prove rather a disadvantage than otherwise; for, though the land may be sufficiently elevated above the nearest river, it appears to be generally of a swampy nature, except a strip along the immediate bank of the river."

Of 142 miles down the Ombabika from the height of land, to the Albany, Dr. Bell says (page 108 Geological Report of 1871-2):

"The surface is rocky or swampy as far as we could examine it, with the exception of some small tracts of good land."

Matthew Sargeant, speaking of the country inland from Moose and Albany, said to the Parliamentary Committee of 1749:

"There are vast tracts of land fit for cultivation."

Of the Kenogami or English River, another tributary of the Albany, Dr. Bell writes on page 350 of the Geological Report of 1870-1:

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"North-west of Long Lake House the country is overspread with a sandy and gravelly deposit which appears to be too light to form a good soil, except in some places. * * In a general way it may be said that the whole country examined" (on the exploration by way of the Kenogami) "is * * a sandy soil, generally dry, but in places interrupted by swamps and low rocky ridges. The soil appears to be for the most part naturally poor. * * These sandy deposits * * are underlaid by a light-colored clay which occasionally comes to the surface. * * The Hudson's Bay Company's farm at Long Lake House is situated on this clay formation."

The soils of the eastern and the middle sections of the country traversed by the proposed route having been touched on, now for the soils of the section on the west.

The Severn is said by Dobbs (Account of Hudson's Bay, pages 58-9) to be:

"A very fine river, well wooded, * * through a rich and fertile country."

Dr. Bell states of Knee Lake (page 6 c. Geological Report of 1877-8):

"The soil consists principally of light gray clay and brown gravelly loam; but near the lake, on the north-west side of the lower expansion, most of it is sandy."

On page 9, part III., of the Report of the Department of the Interior for 1878, Dr. Bell states:

"The fine clay-soil along the upper half of the Nelson River has been already referred to. All accounts agree that an equally good clay soil with occasional interruptions of rock, extends thence north-westward through the region drained by the Burntwood River, all the way to the Churchill. A similar country may be said to extend all along the boat-route" (by Oxford, Knee and Swampy Lakes and by Hill and Hayes Rivers) "to York Factory * * Good land is reported to extend over a considerable area southward from the boat-route" (which trends north-eastwardly) "including the country around God's Lake and the headwater of the Severn. That the soil is fertile is proved by the gardens at Norway House, Cross Lake and Oxford House. * * The general character of the country bordering on the Nelson River from Norway House to the Goose-Hunting River" (150 miles due north from Norway House) "is pretty much the same. The whole surface appears to be overspread with light greyish clay which forms an excellent soil. * * The soil is mostly sandy and poor all the way from Great Playgreen Lake to Cross Lake" (on west branch of the Nelson) "thus contrasting with the margins of the East River" (the east branch of the Nelson). "My track-survey did not extend much beyond Goose-Hunting River; but a country similar to that explored above this stream is said to continue to Split Lake."

In his book on Hudson's Bay, the Rev. Mr. Ryerson says on page 142:

"*In the bounds of Rupert's Land, there are millions of acres equally rich and fertile*" (*as the lands of Manitoba*) "*and equally suited * * for farming and agricultural purposes.*"

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Dr. Bell writes (pp. 18 and 30, Geological Report of 1877-8):

"The solid rocks of the region are generally overspread with the prevailing grey clay which, in some cases, is liable to bake and crack in the sun; but in others it forms a soft, mellow soil of excellent quality. * * The prevalence of a light colored clay often constituting a good soil free from boulders, over such a large region, is a fact of much importance in regard to the future value of the country. The deposit is said to extend over the greater part of the region between the Nelson River and the Churchill and even beyond the latter. * * The land would be easy to clear of timber; and considering the unlimited supply of wood for building purposes, fuel, etc., the prevalence of good water in which a variety of excellent food-fishes abound, as well as the greater proximity to Europe, it offers *some inducements to immigrants which are not to be met with in the greater part of the prairie country to the westward.*"

Applying in several quarters and for great lengths though the foregoing evidence does, it is, after all, insufficient ground for positive generalization over an area so vast. Subject to that drawback, it is good for the presumption that, with the exception of a considerable proportion of the section lying in the basin of the Albany and a probably small proportion in the basin of the Moose, the proposed line between the St. Maurice and the Nelson, presents vast areas of excellent soil. The testimony points even still more strongly to the special presumption that that line traverses at its eastern end very great breadths of excellent land in Quebec, and very great breadths of excellent land in Ontario; and at its western end very great breadths of land approaching in richness the tract known as "the fertile belt."

Now as to the point at which it becomes necessary to deal with a misapprehension which partakes of prejudice—that which insists that the climate of Hudson's Bay is fit for but Esquimaux and icebergs.

The country around Lake St. John is distant on a line east of north, between 70 and 100 miles from the proposed route of the trans-continental highway. The Report of the Quebec and Lake St. John Railway Company says of that region:

"The climate is milder; the snow-fall less; and sowing and harvesting two weeks earlier than in the neighborhood of Quebec."

Speaking of the Hudson's Bay Company's post near the height of land immediately above Lake Mistassini, Richardson gives an insight into the climate there when he says on page 297 of the Geological Report of 1870-1:

"The coarse grass was from three to four feet high, while timothy was two feet high, on the 9th of July. Blueberries were ripe on the 5th and 6th and raspberries on the 7th and 8th of July."

A gentleman of Quebec gives some insight into the climate on Lake Mistassini when he says he found in the surrounding country quantities of wild grapes.

Of the east side of James' Bay, Dr. Bell says on page 25 c. of the Geological Report of 1877-8;

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"During our journey up the coast and back in the months of July, August and September, we enjoyed very fine weather the most of the time. There was very little rain and only two or three days of fog. The prevailing winds were from the south-ward and the temperature was warm and pleasant. The superiority of the weather over that of Lake Superior was a subject of frequent remark among my voyageurs, who had been accustomed to that Lake all their lives. We saw no ice with the exception of a little 'Bay ice' at the commencement of our journey" (begun on the 7th of July) "which had been driven into the neighborhood of the mouth of Moose River after northerly winds had prevailed for many days. I took the temperature of the sea upwards of 20 times during our voyage, which extended over the greater part of July, August and September; and found it to average 53° Fahrenheit. I also noted the temperature of the rivers which we visited" (on the east coast of James' Bay) "and found that of the average of five of them to be 61° Fahrenheit. We bathed in the salt-water almost daily and found the temperature agreeable."

On page 16, Russell referring to one of the rivers of East-main-coast of Hudson's Bay, a river not shown on the map under the same name, says:

"Mr. Davis, in an article read before the Literary and Historical Society of Quebec, speaks of the pleasing aspect of the valley of the Hamilton River, of its * * having some advantages in climate."

In his book on Hudson's Bay, Dobbs says on page 12:

"Captain Gillam got into Rupert River on the 29th of September. * * The 9th of Dec." (Nov.?) "they were frozen up in the River. * * In April, 1769, the cold was already all over. * * In 1770 the ice began in Rupert's River on the 10th of October; but they had warm weather after that. The River was frozen on the 6th of November. * * About the 20th of March it began to thaw. * * The River was thawed on the 20th of April."

Dobbs says that the climate of Rupert's River is "very good." Mr. Gladman states (page 392 of Report of Imperial Parliamentary Committee of 1857) that the climate at Moose Fort is "good." Dr. Bell says:

"On our return to Moose Factory we found that there had been no frost all the Summer. * * On our return to Moose Fort in the end of September * * we found the most tender plants, such as melons, cucumbers, beans, balsams, tobacco, the castor-oil bean, growing in the open air, were still quite fresh and green."

Referring to the vallies of the Missinaibi and the Moose, Dr. Bell says (Geological Report 1875-6):

"As stated in my report of 1875, the climate in going northward from the height of land beyond Lake Superior, does not appear to get worse but rather to improve till James' Bay is reached."

Dr. Thompson stated to the Parliamentary Committee of 1749:

"They dig" (at Moose Factory) "and sow peas in the middle of May, when they can dig a foot and a half or two feet deep."

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Captain Mitchel stated to the same Committee:

"At the bottom of the Bay" (mouth of the Moose) "the frost breaks the 3rd or 4th of May."

Gladman says, page 390 of the Report of Parliamentary Committee of 1857, that at Fort Albany "the climate * * does not differ much from Moose." Dobbs says (page 13) of Fort Albany:

"The frost began in October, 1729. * * The *Creek* near the Factory was frozen over on the 13th; by the 21st there was a great deal of floating ice in the *River;* by the 31st it was fast as far as Charles Creek; by the 5th of November the whole River was frozen over; but not so strong as to bear. March * * to the 17th, fine, clear weather with some snow; then to the 29th, clear weather, tolerably warm; on the 30th a snow-storm; and then it began to thaw in the middle of the day; it continued thawing till the middle of April; then two days frost; * * * the 29th the ice gave way to the head of the Island; * * * the ice continued driving in the River until the 5th of May; * * * * then the River fell five feet by the breaking of the ice at sea; the 8th the Indians came down in their canoes to trade; the 16th they began to dig their garden; 22nd the tide began to flow regularly; * * fine, warm weather from the 11th of May to the middle of September."

To the Parliamentary Committee of 1749 Robert Griffin said:

"The land is cultivated for a mile round Albany Fort, being dug with spades upon the breaking up of the frost, which generally happens about the 20th or 27th of April."

The climate of the Albany is described by Dobbs as "temperate" and "very tolerable." Of Martin's Falls, on that River, Russell says on page 14 of his book:

"Mr. Barriston, who resided there, says that it has the winter of Russia and the July and August of Germany and France; that in the usual course of the seasons, the buds of the trees begin to swell about the 12th of May and leaves expand about the 28th of May. * * By the 1st of October foliage is yellow and falling."

In the Geological Report for 1872-3, Dr. Bell says of the Albany:

"I ascertained that the River between this point" (Martin's Falls) "and James Bay is open on an average six months of the year."

Of Long Lake House, one of the sources of the Albany, Dr. Bell says (Geological Report of 1870-1, pages 350-1):

"The potato-tops had not been touched by frost up to the time of harvesting, which was during the first week of October."

Passing now to the west side of the country under examination, the Geological Report of 1877-8 contains, on pages 29 and 30, these words of Dr. Bell:

"The forest and flora generally of the Nelson River region indicate a milder climate than that of the corresponding tract on the opposite side of the Bay. * * This condition of things also prevents the occurrence of summer frosts in the Norway House region, which appears to enjoy a climate fully as good as that of the Province of Manitoba. * * The Nelson River carries with it towards the sea the

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high temperature of Lake Winnipeg, derived partly from rivers of the South and West. * * The climate of this region is pleasant in summer without an excess of rain; and in winter, the weather although cold, is said to be bright and uniform with only a moderate amount of snow."

Ballantyne says on pages 116 and 122:

"Norway House is perhaps one of the best posts in the Indian country. The climate is dry and salubrious, and although (like nearly all other parts of the country) extremely cold in winter, it is very different from the damp, chilling cold of the season in Great Britain. * * The sun shines brightly in a cloudless sky, lighting up the pure white fields and plains with dazzling brilliancy."

The following shows some heat-averages between the St. Lawrence and the Nelson and others along the route from Ottawa to Winnipeg:

Stations.	Average of Fahrenheit.				
	Spring.	Summer.	Autumn.	Ripening months (July and August).	
Quebec	47.70	61.40	26.40	66.10	
Ottawa	51.60	64.00	26.20	68.50	
East Main Coast.	.....	.....	.....	65.50	James' Bay.
Moose Fort	34.58	62.20	.....	64.78	
Fort William	39.67	59.94	37.80	60.52	...Lake Superior.
Norway House	26.23	59.87	29.93	62.35	Lake Winnipeg.
Winnipeg	46.50	60.30	17.10	64.60	

The above table shows that its two stations on Hudson's Bay enjoy during the ripening season, a higher temperature than either Fort William or Winnipeg. It says that the Spring is earlier at Fort William and Winnipeg; but some of its story coupled with that positive fact at Norway House, points to the supposition that that disadvantage is met by compensations in a later Autumn. Norway House has, it will be observed, an Autum of considerably longer duration than that of the wheat-region around Winnipeg. In fine, while local circumstances such as proximity to the ice of James' Bay or the existence of swamps, may, and if we are to conclude so from differences in

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the size of the trees, *do*, disturb the conclusion in some places, there seems to remain little or no doubt that the country between Norway House and Quebec enjoys a climate which, though, on the shore, eight or ten degrees colder in Winter, is fully as favorable as, if not superior to, that of Winnipeg, during the season of ripening. And now to test the value of this deduction by actual facts of growth. Dividing the route out of Quebec into sections of one hundred miles each, these facts may be grouded as follows:

SECTION 1. At several points on this section up to the farms on the Croche and on the St. Maurice at La Tuque, are grown oats, barley, rye, wheat. At La Tuque Messrs. Ross, Ritchie & Co., produce for the use of their timber-industry, potatoes, turnips, hay, oats—last year, 1000 bushels of oats and 800 tons of hay. A few miles north of this section Messrs. G. B. Hall & Co., grow on the Croche, good potatoes and other vegetables. They harvested last year 800 tons of hay and 500 bushels of oats. At Rat River, below the intersection of the proposed route with the St. Maurice, a farm known as "Baptist's," produces potatoes, hay, oats—largely and of excellent quality. Last year, settlers in that neighborhood harvested some wheat. Up to the end of this section the settlements on the St. Maurice continue. They yield hay, oats, buckwheat, peas, beans, vegetables of all kinds. The settlers have found wheat so good a crop that they have gone on increasing every year the breadth of its cultivation. Other settlements extend as far up the River as Weymontachinque on section 2 of the proposed route and grow the same crops with the same success—including wheat.

SECTION 2. On the route of this section, Hudson's Bay Company officers produce at Weymontachinque potatoes and other vegetables—last year, some hay for their cattle and 500 bushels of oats. Of Kirkendatch, a short distance farther up the St. Maurice, Mr. Richardson says (Geological Report 1870-1, page 300):

"Mr. Spencer * * told me that the few cows which he keeps thrive remarkably well, pasturing in summer on the flats, while in winter they are fed on the wild grass, cut and dried to hay."

Between 70 and 100 miles north-east of this Section 2, lies the basin of Lake St. John. Of that region, the report of the Quebec and St. John Railway Company says:

"Excellent crops are raised here, including wheat equal to any grown in Canada."

The Toronto *Mail* of some months ago said:

"The agricultural progress of the Lake St. John district of Quebec is reported to be exceedingly rapid. * * During the past ten years the population of the locality has increased 67 per cent., the acres of cultivated lands 116 per cent., bushels of wheat raised 1,147 per cent., butter 140 per cent., and live stock 139 per cent."

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SECTION 3. One hundred and fifty miles north-east of this section is Lake Mistassini. Of the Hudson's Bay Company's post there, Mr. Richardson (Geological Report) says :

"What influence the climate may have on vegetation I am unable to determine; and the only fact I can offer bearing upon this is that Mr. Burgess * * furnished us on the 7th of August with fair sized potatoes, these being the only crop at present cultivated there."

A gentleman of Quebec (referred to before) states that he found wild grapes growing near Lake Mistassini. He asserts that the region from Lake Mistassini to the head of the St. Maurice is highly favorable to the growth of all the cereals.

Fifty miles north-east from this section, at the site of an old Fort of the Hudson's Bay Company, Mr. Richardson (Geological Report) speaks of timothy grass two feet high and of ripe blueberries and raspberries.

SECTION 4. No particulars obtained in direct application to this section.

SECTION 5. One hundred miles north-east of this section, is Rupert's House. Dr. Bell says :

"The gardens of Rupert House * * show that potatoes and vegetables thrive well."

Dobbs says (page 112) of Rupert's House :

"Very large timber trees of all kinds, oak, ash, &c. * * They have exceedingly good grass to make hay with * * and may have everywhere in the land, all sorts of pulse and grain and all sorts of trees in the same climate in Europe; for what they have thrive very well. * * Saw no grain there; but many gooseberries, strawberries and dewberries."

A hundred miles south-west of this section is Lake Abittibi—a Lake within the basin of Hudson's Bay. Mr. McOuat says (page 134, Geological Report 1872-3) :

Several acres * * are cultivated at the Hudson's Bay Company's post at Abittibi and with satisfactory results. The only crop grown at present is potatoes; but I was informed by a man who has charge of the farming operations (a French Canadian who has been more than 30 years at Abittibi; but was brought up as a farmer near Sorel, in the Province of Quebec) that several other crops, including wheat, had been tried in former years and with such results that he is inclined to insist that all the ordinary cereals can be cultivated as successfully at Abittibi as on the St, Lawrence. Such an opinion from a man who has been for so many years practically engaged in the cultivation of the soil is worth recordiug and ought to be reliable."

SECTION 6. Two hundred and fifty miles north-east of this section lies Fort George—three and a half degrees of latitude more to the north than this section and seven degrees more to the north than the City of Quebec. Mr. Bell says (Geological Report 1877-8, pages 29-50) :

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"The gardens at * * Fort George show that potatoes and all the ordinary vegetables thrive well. * * At Fort George I saw a quantity of good spruce logs. * * Many of them measured two feet in diameter at the butt."

One hundred and seventy miles north-east of this section, is East Main House. Of that place, Dr. Bell says (Geological Report 1877-8, page 25 c):

"The gardens of * * East Main show that potatoes and all the ordinary vegetables thrive well. The Hudson's Bay Company's establishment at East Main is maintained for the purpose of raising stock. The cattle and sheep which we saw there were in excellent condition."

To the Parliamentary Committee of 1749 Matthew Sargeant said:

"East Main Factory lies on the Slude. * * Has seen fir-timber there 38 inches in diameter."

Gladman says of East Main (page 390, Report of Parliamentary Committee of 1857):

"Raised good potatoes, turnips and other vegetables; * * vetches grow wild on the point of the River; abundance of wild strawberries and currants."

Mr. Russell says in his book:

"Mr. Davis in an article read before the Literary and Historical Society of Quebec speaks of * * the Hamilton (East Main?) River, of its being well-timbered * * and mentions the Hudson Bay Company's farm where cows, pigs and sheep are kept."

Moose Fort lies forty miles to the north-east of this section. Mr. Gladman who had lived there for several years, says (page 392 of Report of Parliamentary Committee of 1857):

"Raised potatoes and other vegetables there in great abundance; barley ripened well; small fruits, as currants, gooseberries, strawberries and raspberries, plentiful; grow wild; never knew wheat tried, the season being too short; horned cattle, horses, sheep and pigs kept there, all housed in winter."

Dobbs says on the authority of Mr. Frost, who had resided at Moose Fort:

"Upon the southern branch of the Moose all sorts of grain thrive, as barley, beans, and peas do at the factory."

Russell says on page 12 of his book:

"Umfraville, writing in 1790, says * * about Moose Fort pine trees are found of all diameters; and adds further that potatoes, turnips and almost all kitchen-garden stuff are raised with facility; and no doubt corn could be raised."

In the Geological Report of 1875-6, Mr. Bell says (page 339):

"At Moose Factory, * * farm and garden produce in considerable variety are raised every year. Among the crops harvested in 1874, were 1,700 bushels of good potatoes. Oats, barley, beans, peas, turnips, beets, carrots, cabbages, onions, tomatoes, etc., are grown without any more care than is required in other parts of Canada; and

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I was informed that some wheat which had got accidentally sown one year, was found to ripen. * * Upwards of 80 head of cattle are kept at Moose Fort, besides horses, sheep and pigs."

Before the Parliamentary Committee of 1749 on the subject of the Hudson's Bay Company, John Hayter said:

"Has grown barley at Moose Fort; * * the ear was large and yielded as well as, in his opinion, the barley sown on common ground in England."

Dobbs states on page 12 of his book:

"At Moose * * are very large timber-trees."

Dr. Edward Thompson testified before the Parliamentary Committee of 1749:

"There are" (at Moose Fort) "white pine trees 40 inches in diameter; * * has been 50 or 60 miles inland and thinks the soil and climate of Moose River is proper for producing beans, peas and barley, as it is in several parts of Yorkshire; has seen better barley and oats grow at Moose River than he ever saw at the Orkneys; * * himself sowed about a dozen corns of wheat for a trial in October, which lay in the ground all winter covered with snow and came to perfection in August."

Enoch Alsop told the Parliamentary Committee of 1749:

"He had sown at Moose, barley and oats, the same seed three years successively."

In his "Six Years Residence in Hudson's Bay," Robson says that fall wheat sown at Moose Factory stood the winter frosts and grew very well in the following summer.

SECTION 7. One hundred and fifty miles south-west from this section, lies New Brunswick House—within the basin of Hudson's Bay. About fifty miles still farther south are Lakes Mattagami and Missinaibi—both within the basin of Hudson's Bay. Dr. Bell says (page 361 Geological Report for 1875-6):

"Farming and gardening have been successfully carried on by officers of the Hudson's Bay Company at their posts on Lakes Mattagami and Missinaibi; at the latter, Mr. John McIntyre, now of Fort William, has informed me that he found spring wheat to ripen well."

On page 390 of the Report of the Parliamentary Committee of 1857, Mr. Gladman says of New Brunswick House:

"Raised excellent potatoes and every description of vegetables; oats ripened very well; had barley also. Has since heard wheat has been tried with success. Horned cattle kept there, housed during winter. Know nothing to prevent a good settlement there."

North east 80 miles from this section, is Fort Albany. Of that place Dobbs says (pages 45-6) there are:

"Very large timber trees of all kinds; * * they have exceedingly good grass to make hay with * * and may have everywhere within the land, all sorts of pulse and grain and all sorts of fruit trees in the same climate in Europe; for what sorts they have tried thrive very well."

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Before the Parliamentary Inquiry of 1749 on the subject of the Hudson's Bay Company, the following was stated as to Fort Albany, by Matthew Sargeant:

"The turnips he has eaten there are as good as ever he eat in England; * * in his opinion oats would ripen at Albany, where he has a cherry-tree bearing black cherries; * * very large lettuce, spinage, dewberries, strawberries and black cherries; * * believes there is time enough to grow wheat; * * grass grows there sufficient for the support of cattle; * * they make hay at Albany; * * believes corn would grow 20 miles north of Albany."

Robert Griffin said to that Committee:

"Has seen oats grow to perfection at Albany; has seen peas, beans, turnips, sallading and cabbage and some few carrots; * * the beans are generally blighted; but the turnips, peas and cabbage are in great plenty and perfection; but fresh seed are sent over every year; * * if he had a grant of a hundred acres of land and liberty to trade, he would settle there with all his heart."

Captain Mitchel answered the Committee of 1749 as to Albany:

"They have twice attempted to raise corn without success * * sown in June; * * turnips and peas are sown in May and come to perfection in August or September."

Robert White said to the Committee of 1749:

"The Governor at Albany had a garden in which peas, beans, turnips and salad grew as good and plentiful as in England; but he had never seen seed raised in the country sown again."

SECTION 8. Long Lake House is within the basin of Hudson's Bay, about 150 miles south-west of this section. On page 351, Geological Report for 1870-1, Dr. Bell says:

"Oats and barley have been successfully cultivated at Long Lake House, while hay, potatoes and all the ordinary vegetables thrive remarkably well."

SECTION 9. Martin's Falls is situated on or about the route of this section. Of that place, Dr. Bell says (Canadian Sessional Papers of 1872):

"Hay, turnips and potatoes have been successfully cultivated for a long time at this post; and the cattle kept here thrive well."

SECTION 10. No particulars have been obtained in reference to this section.

SECTIONS 11 AND 12. Two hundred and twenty miles north-east of section eleven, is Fort Severn. From that place to Severn Lake, 50 miles north-east of section 12, the River Severn extends above the proposed route of the Pacific Railway. That stream is described by Dobbs (pages 58-9) as "*well-wooded* * * through a * * country full of *fine woods*." One hundred and sixty miles north-east of section 12 is Rock House, at which vegetables may be said to grow, if we may so infer from mention by MacLeod's Simpson's Diary, of its "gardens." Two hundred and seventy miles to the north-east of

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section 12 lies Fort York. In his "Six Years Residence in Hudson's Bay" Robson says (page 43):

"Upon Hayes River, 15 miles from the Fort," (York) * * "after paling in some ground for a coney-warren and for oxen, sheep and goats, I should expect by no more labor than would be proper for my health, to procure a desirable livelihood, not at all doubting of my being able to raise peas and beans, barley, and probably other kinds of grain. * * Most kinds of garden-stuff grow here to perfection, particularly peas and beans. * * Gooseberries and red and black currants are found in the woods, growing upon such bushes as in England."

To the Parliamentary Inquiry of 1749 into the Hudson's Bay Company, Dr. Thompson answered:

"He apprehended that corn would grow * * even as far north as Fort Nelson."

To the same Committee, Matthew Sargeant said:

"That it is the general opinion of the Factory at Fort York that the soil" (and climate?) "is proper for wheat, barley, rye, oats; that he has seen very good beans and peas grow there, but he never saw any corn there; * * that his messmate did sow some corn there which, though it grew a good height, never came to perfection."

SECTION 13. About 100 miles north-east of this section, lies Oxford House; and about eighty miles north-east of it, lies the Mission-farm. Of the first of these places the Rev. Mr. Ryerson says in his "Hudson's Bay" (page 100):

"The premises of this" (Oxford House) "establishment cover several acres of land in a high state of cultivation, and upon which there are now growing in fine order, barley, peas, potatoes, etc."

Dr. Bell states (page 30, Geological Report 1877-8):

"At Oxford House, barley, peas, beans, root-crops, vegetables, and hay thrive very well; and the surrounding districts might make a good dairy-farming country."

Of the Mission-farm, Mr. Ryerson writes (page 99):

"There are about 15 acres of land on the peninsula, all of which are mission-property. The land is of most excellent quality, producing abundantly all kinds of vegetables. There are now growing more than an acre of excellent potatoes, several patches of turnips and in the garden, beets, parsnips, carrots, onions, &c., &c., in great abundance."

SECTION 14. Rossville, Ross Island and Norway House are on or near the route of this section. Of Rossville, Ryerson says:

"The local situation is remarkably pleasant and the land very rich and productive. The garden looks beautiful; it is large and full of the most useful vegetables, all of which are in fine order and growing luxuriantly. There is also a field of potatoes that looks remarkably well."

Dr. Bell writes (Geographical Report 1877-8, page 29) of Ross Island:

"Even the most rocky tracts support a growth of trees large enough to be of value for many purposes should this great territory ever become inhabited by civilized men. * * Here many of the white spruces measure three feet in diameter."

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Dr. Bell says (page 29, Geological Report, 1877-8):

"Small fruits, cucumbers, musk-melons and vegetables of all kinds come to maturity at Norway House. Barley is a sure crop. Hitherto as there has been no object to be gained in attempting the cultivation of wheat, the experiment does not appear to have been tried in this region; but there is every probability that it would succeed."

On page 87 of his book, Ryerson states of Norway House:

"There is a large, beautiful garden belonging to it, which would be a credit to the best domicile in Canada. In this splendid garden were growing in prime order, almost every useful vegetable, among which were seen in great abundance, potatoes, onions, squashes, beets, parsnips, celery, vegetable marrow, cucumbers, &c., &c.; and then the flosculous part of the garden was truly and exquisitely fine; the flowers are in great variety, and in beauty and richness of colour are not surpassed anywhere."

And now that these specifications have opened the way, there is little if any rashness in going on to a startling conclusion. The summer heat-average of 60° (Fahrenheit) passes, according to the American physicist, Blodgett, from the mouth of the River St. Jean, in Gaspe, through Lake Mistassini, to East Main House on the shore of Hudson's Bay. It proceeds thence to Split Lake on the River Nelson, and from that through the middle of Rein Deer Lake, to Fort Chippewayan, at the confluence of the Peace and the Athabasca. From the latter place, it follows the same general direction to the 116th degree of longitude; and from that, describing a quadrant, crosses the junction of the 120th meridian with the 58th parallel. It passes thence in a line east of south, by way of the confluence of the Goose River and the Smokey.

Somewhat north of that Summer isothermal of 60° lie several of the Townships of Gaspe, with their bees and their sheep and their oxen and their cereals—those Townships including Gaspe Bay North, Cape Rosiere, Mont Louis, Cloridorme, whose returns of production show in the census of 1871, so large a proportion as from 21 per cent. to 39 per cent. of the whole of their grain crop to be wheat. On the other end of that summer-heat-average is Fort Chippewayan; and *north* of that end is Fort Liard, Dunvegan, St. John's, Hudson's Hope—points which are known to yield wheat. Now even though the summers on whose averages Professor Blodgett's generalization rests, were exceptional, even though his generalization rest on a breadth of data too narrow to give it any claim to accuracy, the fact that it runs parallel with the proposed route of the Pacific Railway at a distance so great as 120 miles farther to the north, makes it still good for the conclusion that that route lies, if any authority attaches in the matter to a generalization from heat-averages, within the zone of that tender cereal, wheat.

Obstinate misapprehension as to the country between the St. Maurice and the Nelson demanded correction at some length. That necessity of intelligent judgment on the route proposed having been

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met, the review of the lands along that route may now be entered on at other parts, beginning with the division west of the Rockies. Beyond Pine Pass, the "Central plateau" of British Columbia on the route proposed is not more attractive to agriculture than it is beyond Yellow Head Pass. "Pockets" or "fans" on the water-courses are the only instances in either case of good soil; and the difference in their aggregate areas is hardly worth considering. The bunch-grass of the southern part of the plateau and the scanty supplies of rain in that region are drawbacks which do not apply in the corresponding region more to the north. The improvement in the quality of the grass and the more generous rainfall do not, however, apply in a comparison of the two routes to an extent leaving a very considerable difference in favor of the agricultural opportunities on the route proposed.* There seems to be no ground whatever on the line westward from Pine Pass or on that westward from Yellow Head Pass, for expecting any important reduction of the burdens of the railway on the taxpayers from the development of the lands.

On the eastern slopes of the Rockies, the lands along the proposed route have been examined above at some length. Recurring to the statements made on that part of the country traversed by the direct line from Quebec, it will be seen that a vast square of great agricultural richness extends from the Mountains eastward, down the Peace and across the valley of the Athabasca. Passing on still eastwardly, those fine soils are found to extend much farther. From their compact area on the Peace and Athabasca, they throw out two prongs, one extending at an angle of 30 degrees with the parallels of latitude to the rich wheat-fields of Manitoba; and the other extending almost due-east in equal fertility, between the 54th and 55th parallels, as far as the western bank of the outflow from Lake Winnipeg. The first of these has received general acceptance as "the fertile belt;" but inasmuch as the other "fertile belt" has not been brought fully within popular knowledge, it becomes necessary here to place its existence on evidence as good, as specific, and perhaps as full, as that justifying any of the soil-delineations of the official map.

Mr. MacLeod says in his "Simpson's Voyage to Peace River," that the alleged limit of the fertile belt does not go far enough north. Cumberland House shows that it does not go far enough east. That place is in latitude 54°, longitude 102°. In his "Narrative of a Journey to the Shores of the Arctic Sea" (pages 24 and 56) Dr. King says:

"The ground around Cumberland House is not only excellent but fit for immediate cultivation; and exhibited a few years ago a very productive farm. * * Of fruits, strawberries, raspberries, cranberries and a variety of gooseberries and currants, are found in vast quantities."

* MacLeod differs from what seems to be the general opinion as to the central plateau even above the bunch-grass region. In his Simpson's "Peace River" he says: "Another fact to which I think it necessary to direct attention is that the great and beautiful and *fertile* plateau of middle and of northern British Columbia is not too high, nor too cold, nor objectionable on any score, for settlement."

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In answers 5706 *et seq.* to the Parliamentary Committee of 1857, Dr. King states :

"On approaching Cumberland House I found a little, new colony established, of about 30 persons, a Canadian, an Englishman and half-breeds; they had their fields divided into farms. * * It appeared to me, going on their farms, that they were very highly cultivated; there was corn, wheat and barley growing. * * I would say that there were 1,500 or 2,000 acres. The cultivation was quite successful; the wheat was looking very luxuriant. * * There were potatoes, barley, cows and horses."

McLean's "Hudson Bay" (page 224, Vol. 1) says :

"Here" (Cumberland House) "I was cheered by the sight of extensive corn-fields, horned cattle, pigs and poultry, which gave the place more the appearance of a farm in a cultivated country than of a trading post in the far North-west."

On page 392 of the Report of the Parliamentary Committee of 1857, Mr. Gladman states that the Indians at Cumberland House raise wheat, barley and all kinds of vegetables.

Mr. John Fleming (Hind's Exp.) says :

"The country around Cumberland is low and flat; the soil in some places is a stiff clay; but in general it consists of a gravelly loam a few feet in thickness covering a horizontal bed of white-limestone. * * There are ten acres enclosed and under cultivation. * * I observed a field of barley and another of potatoes, both looking well; and there is an excellent garden; the soil appeared rich and fertile, bearing an exuberant growth of rhubarb, cabbage, peas, carrots, and other vegetables."

Dr. King bears positive evidence that the fertile lands which he had described in the basin of the Mackenzie extend to Cumberland House when he said in answer 5667 to the Parliamentary Committee of 1857 :

"The whole of the country at Cumberland House is entirely alluvial."

And in answer 5669 that :

"My enquiries at *Cumberland House*, at Norway House and at Athabasca were : 'To what extent does this' (the fertile belt) 'go?' Upon my enquiry at Cumberland House as well as at Athabasca, they told me that the above line of country was precisely the same."

The Pas Mission is situated at about one-fourth of the distance from Cumberland House on the line to Norway House. Mr. John Fleming says of it (Hind's Exp) :

"The river banks at Pas are 10 to 12 feet high, composed of light-colored drift clay holding pebbles and boulders of limestone; the surface soil is a dark gravelly mould well adapted for cultivation. * * Barley and other crops growing here, looked well and were just ripening."

On the Saskatchewan, about midway between Cumberland House and Norway House, Captain Back saw an evidence of good soil, if, where the range of choice included any part of the fertile belt, the existence of a farm is good for that interpretation. He says on page 64 of his Narrative :

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"In the River Saskatchewan I was not more pleased than surprised to behold on the right bank, a large farm house with barns and fence enclosure amid which were grazing eight or ten fine cows and three or four horses."

Colonel Crofton stated in answer 3316 to the Committee of 1857 that corn may be grown at Norway House—latitude 53¾°, longitude 98°. In answer 182, he said he had seen rhubarb, peas, cabbages, and many other vegetables, growing with success there. Ballantyne says (page 88): "Behind the Fort" (Norway House) "stretches the thick forest, its outline broken by cuttings of firewood or small clearings for farms." On page 126 he speaks of "rambling in the groves and woods of Norway House" and of "the lofty pines at Norway House." Gladman says on page 392 of the Report of the Parliamentary Committee of 1857, that wheat may be raised at Norway House, and that the soil there is good. And in answer 5669 to that Committee, Dr. King testifies directly to the point that the rich tract he saw in the basin of the Mackenzie continues all the way to Norway House, when he says:

"My enquiries at Cumberland House, *at Norway House*, and at Athabasca, were: 'To what extent does *this*' (the fertile belt) 'go?'"

Whatever be its width, an extension of the rich soils of the Peace and of the Athabasca may be concluded on this evidence, to hold to the western bank of the outflow from Lake Winnipeg—an aggregate distance on a direct line from the Rockies, of 900 miles.

The lands along the proposed route have been reviewed at some length. The results of that review may be now recapitulated.

Beyond the Rockies, the country traversed offers little temptation to agriculture, though, perhaps, more to stock-raising. Immediately east of Pine Pass, the lands present a compact body which includes one-half the aggregate wealth of the North-West in soils. That vast area, consisting of luxuriant prairies, interspersed with forests, is drained by a system of water-ways so distributed throughout the whole as to offer the settler access to every part of it when a general line of inlet and outlet shall have been supplied to him by a Railway. The rich soils of that region extend, according to delineations of the official map, for 600 miles along the proposed route; and according to the evidence cited on the subject above, extend 300 miles additional —to Norway House.

From Norway House—that is to say from Mossy Point, at the outflow from Lake Winnipeg—Dr. Bell's map shows banks for 25 miles to the westward, all of clay. Similar banks extend down the Nelson on the eastern side. The clay-soils of the Churchill are traced across Burntwood River to the Nelson, and across the Nelson for nearly 150 miles farther east-ward. Clay-soils the same in appearance, stretch on still more to the east; and are spoken of in several places and in great lengths, all the way to Lake Mistassini.

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At Knee Lake, at Oxford House, at the Mission Farm, on Long Lake, on Lake Mattagami, on Lake Missinaibi, on Lake Abittibi, they are proved to be highly productive; and that proof is extended in its application by explorers' descriptions of many stretches of the country between Norway House, across the heads of the St. Maurice, to the region as far eastward as Lake Mistassini. On a basis of evidence almost as broad as that on which the existence of a North-Western fertile belt rests, that extension of "fine clay-soils" from the western shore of Lake Winnipeg and the eastern bank of the Churchill may be described with strong presumptions of truth, in a similar generalisation to that accepted in the fertile belt of the North-West—one including breadths of swamp and of rock and of inferior soils—as, however different the degree of fertility may prove to be, "the fertile belt" of the North.

The route up the St. Maurice may be said to lie through lands varying from fair to excellent, for an equivalent length of one-half the whole distance. But the existence of a stretch of 2000 miles of farming country along the route proposed for the Pacific Railway—a stretch of over 900 miles on the other side of the Nelson, beginning within three hundred miles of an emigrant-landing-place, at Port Nelson, and a stretch of over 1000 miles on this side of the Nelson, beginning within three hundred miles of an emigrant-landing place, at the City of Quebec—fixes the *locale* of that Railway absolutely under any policy which, looking in the face the danger of financial disaster in the undertaking, seeks to avert that danger by the conversion of the lands along the route.

The topography of the two lines goes to the question of cost of construction, of working, and of maintenance. Save for 30 or 40 miles immediately back of Quebec, the substitute route is highly, is exceptionally, favorable as far as Norway House. West of that House the 900 miles to the gap at the head of Pine River may be set down as very much alike to the corresponding section of the adopted route—still favorable. Executed in accordance with the standard proper in a line of colonization, in a line which can go on to the standard proper to large traffic as the development of traffic creates the necessity and supplies the means, the proposed line can be constructed from Quebec to the Rockies for thirty-five millions of dollars. West of Pine Pass the route runs across a rolling country and along water courses which offer very much shorter stretches of difficult work than those on the route to Burrard Inlet. The cost between the Mountains and the Sea will probably not average more than half that of the estimated rate on the latter line—not more than, say, $50,000 per mile.* That would make the cost from Pine Pass to Port Simpson about twenty-five millions—the cost to Kamsquot about sixteen millions.

* The line from Yellow Head to Port Moody is set down in the worthless estimates of the official reports at $62,000 a mile; the above proceeds on a statement of better authority that the cost will be $100,000 a mile—the cost, according to the lowest tender for one-fourth of the whole, amounting, for road-bed only, to $80,000 per mile.

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Some of the points presented above may be summed up in general, thus:

Heads of Comparison.	Adopted Route.	Proposed Route.	
	Quebec to Port Moody.	Quebec to Port Simpson.	Quebec to Kamsquot.
Total length in miles	3,015	2,880	2,700
Miles West of Rockies	500	500	320
Miles of Light Works	1,000	2,300	2,300
Miles of Heavy Works	1,650	500	320
Miles of Convertible Lands	500	2,150	2,150
Miles of Inconvertible Lands	2,150	650	470
Miles to be Constructed	2,650	2,800	2,620
Supposed comparative Cost	$110,000,000	$60,000,000	$51,000,000

The line to Kamsquot will be seen to be but one-half the cost of the line to Port Moody. It reduces the distance between tidewater and tidewater more than 300 miles.* It opens up four times the extent of good soils; and much of the increased area being accessible from the seaboards by greatly shorter distances for emigration, it increases, therefore, the probability and the means of reducing the burden of the cost upon the people of these eastern Provinces. With better lines and planes; with, at all events, *some* mechanical economy remaining to the credit of its lower summit; with less cost for running, less cost for maintaining and but one-half the cost for interest on construction-account, the line proposed to Kamsquot would save, in comparison with the adopted route to Port Moody, a burden to the taxpayers during the period of developing business, of from three to four millions per annum. And the hope of ultimate release from the remaining burden would not be, as in the case of the adopted route, open to doubt. If the business of Manitoba had not been drawn by suicidal folly into competition with water-carriage on Lake

* A difference of 240 miles mentioned in a former pamphlet on this subject has been taken to apply between the adopted and the proposed route. It was intended to apply to the route from Quebec by way of Norway House to Pine Pass as compared with that to Pine Pass by way of Winnipeg.

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Superior, it would all pass into that basin of many navigations, Lake Winnipeg, a contribution for six months every year, to the traffic of the Railway from Norway House to Quebec.

But that traffic now lost, its place will be taken by rapid development along the great water-ways of Hudson Bay and of the North-West—*every one of which the proposed route taps*. The fishing, the shipping, the lumbering, the shipbuilding, which the Railway on the route from Quebec will start into vigorous life on Hudson's Bay, will supply it with large contributions of way-business. Opening up the Harricanaw, the Abittibi, the Moose, the Albany, the Equam, the Deer, the Severn, the Weemisk, the Wastickwa, all navigable by some sort of vessel and all rich in timber and in clay-soils, it will receive from them in due time large returns in freights. Carrying emigrants to the prolific land of the North-Western "fertile belt," it will distribute them to the right and to the left in the basin of Lake Winnipeg, the lower valley of the Saskatchewan, the valley of the Lac la Ronge, the valley of the Beaver, the valley of the Athabasca, the valley of the Peace, the valley of the Smokey, the valley of the Pine, to receive from them soon afterwards large volumes of freight which it will hold beyond reach of competition until it deposits them on the wharves of Quebec. Compared with the route adopted, the route proposed will involve during the development of its traffic, a pressure on Canadian taxation thirty-five or forty per cent. less; and while the former operates on a comparatively small range of development and drops the result in traffic *en route*, the latter operates on a field of development made vast by its tributary navigations; and clinging firmly to the results in traffic up to the very end of its track, promises a release from that taxation beyond doubt of fulfillment, and at a time not by any means remote.

The adopted route ignores all considerations of defence. The substitute-route utilizes the Pacific Railway to the fullest possible extent as an inner line of military communications. Beginning at Quebec, one of the strongest positions in Canada in reference to its defence by land and water, it holds its way to the rear, until, at about 500 miles out, it reaches an alternative of ingress for men and material by way of Hudson's Bay. The branch proposed from that point of ingress up the Abittibi and down the Montreal to a junction of one railway now progressing from Toronto with another now progressing from Montreal, supplies an interior line of defence, connecting Montreal and Toronto with that marine base Opening means, with the assistance of navigation on Lake Winnipeg, of throwing troops from the old Provinces or from England into Manitoba, by the route chosen by the Duke of Wellington, it passes on to the Pacific, separated from the American frontier by a roadless wilderness of a width never less than 300 miles. It discharges upon the Pacific at a point from which the development of British power will confront the menace, will reverse the strategy, embodied in the Russian transfer of Alaska. At that terminus, the Asiatic commerce which may be

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drawn by a trans-continental railway in checkmate of the efforts of the United States, to British American waters, may be made safe by a navy operating on the Northern Pacific from a base covered by a British population from landward approach, on one of the land-locked harbors of the wheat-producing and coal and iron-bearing Islands of Queen Charlotte.

Local interests are the guardians, as they are the exponents, of the general interest. The Province of Quebec will doubtless demand that she shall not be ignored, as she has been, in the location of the Pacific Railway, especially when the ignoring costs her the loss of 450 miles of railway development of her interior and the loss of the seat of Commercial Empire on this Continent—a seat which would be fixed within her borders by the discharge from the Pacific Railway of the surpluses of a boundless region of breadstuffs into the store-houses and ships of "the Ancient Capital." New Brunswick will hardly submit to an expenditure of her taxes on a railway binding the future commerce of this Dominion for ever to Portland—will hardly do so when that commerce may be tapped to the exclusion of Portland by a direct extension from Quebec to a connection at Houlton with the lines from St. Andrew's and St. John. And Nova Scotia will refuse her consent to the application of her monies for the development of the shipping-business of the State of Maine, while the freight-charge-reduction which Halifax has been demanding, may be effected by a continuation of the Quebec-Houlton extension to a junction with the Intercolonial at Moncton, with the result of giving Halifax a reduction of freight-charges on the healthy basis of a reduction of distance, to the extent of 40 per cent.

But what of the burden-bearer of the taxation of the Dominion—Ontario? Five hundred miles of back-country are available within this Province as a basis for the expansion of her Hamiltons, her Torontos, her Port Hopes, her Bellevilles, her Kingstons, her Brockvilles. The true route of the Pacific Railway leaves those centres in undisturbed enjoyment of that vast field for the growth of their business. It does more. It assists them in making it bear immediate fruit along the branch from the River Moose down the River Montreal to Mattawa, a branch which opens up one of most extensive, if not even the most productive, regions of "the level clay country of the north"—including the fine soils of the Montreal, of the Blanche, of Lake Temiscamingue, and of 150 miles of the upper, and perhaps the better, reaches of the Ottawa. With such a vast basis of development at her service, with the opportunity of so powerful an agency for its immediate utilization—350 miles of railway running through it to a place from which that line will obtain discharge at half a dozen points on the Lake-front—the Province of Ontario may be counted on to protest against the employment of her taxes to cut her off from the enjoyment of her own inheritance, the employment of her taxes to stop the growth of her commercial centres by draining off from them the business of the back-country in their

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almost immediate rear. Fully alive as she is to the importance of attracting the products of that region into her own store-houses; and fully aware as she is that they will never reach those store-houses *across a line of railway raking away the business of her cities and towns along the edge of even present settlement*, this Province will certainly insist that, instead of her taxes being applied to any such purpose, they shall be applied in the way most productive of the interests of the Dominion and Empire, while keeping open the expansion-field of her trade-centres and enriching by traffic her North Western Railways, her Northern Railways, her Nippissing Railways, her Midland Railways, her Kingston and Pembroke Railways.

But it will be asked as against a change of route: what is to be done with the commitment of the country in the case of the 400 miles between Lake Superior and Lake Winnipeg? All that can be done in that case is all that can be done in any other such case—make the best of a bad matter. A mistake though the expenditure of even a dollar on that line as a link of the Pacific Railway is, the Government may retire from it without embarrassment—and no good citizen will attempt to make the courageous intelligence of that retiring a subject of other than applause—by turning it to valuable account as a means of access, in conjunction with steam on Lake Winnipeg, to the North Western division of the *true* route to the Pacific.

While giving access to the comparatively limited breadths of rich lands in Manitoba, that roadway will supply by its connection with navigation to Norway House, a highly important agency in the construction of the main line and the settlement of the rich lands between Lake Winnipeg and Pine Pass. But though the retreat may be made now without the confession of a ruinous blunder, one commitment further, one like that of the suicidal folly which speaks of letting contracts on the Fraser, will involve such a challenge of Fate as might be looked for at the hands of those whom the Gods, wishing to destroy, had first set mad.

The change of route demands that all operations, except those on construction between Fort William and Winnipeg, be stopped. Four sets of block-survey parallels,* each 24 miles from the other and connected at lengths of, say, 96 miles by meridian lines, would supply ample *data* as to the soil and topography if grouped around a direct central line from the heads of the St. Maurice to Norway House, on this side of the Nelson, and, on the west side, around a direct central line from Norway House to Pine Pass. Summing up about 10,000 miles, the cost of that thorough exploration would—every dollar of it an expenditure that must be made sooner or later as a necessity of

* Such lines cost in Canada $38 per mile; in the United States from $10 to $16. The practice in the former case includes an unnecessary accuracy and an unprofitable association with abstract science. These otherwise praise-worthy niceties cost too much. They ought, therefore, to be disregarded. The surveys accomplish all practical purposes of settlement by their corner-posts. The settler can trace his boundaries between these posts just as well, whether they follow parallels and meridians exactly or approximately, whether they be precisely a mile apart or a few chains more or less.—All this with sincere respect for the professional zeal and acquirement of the Surveyor-General and his staff.

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settlement—amount, at the rates of the practice in the United States, to less than $160,000. That surveying done, railway-routes projected under the light of its results could be culled out in the regular professional course of action, by reconnoissances at a few of their points. The debatable ground thus reduced to the comparatively narrow limits within which the instrument must be called in to assist the eye, the ultimate decision on the route for the railway between Quebec and Pine Pass might be made at a cost which ought not to exceed, with plan and providence, $100,000.

All that has been said on the subject above does not alter the fact that, so vast as is the country between Quebec, Norway House and Pine Pass, it is comparatively unknown. The presumptions which have been drawn in the foregoing as to its topography, soil, climate and growth apply to the whole region, because of their localism, with a force wanting in positiveness. But much additional light is probably obtainable from records of the Government; and still more may be brought out by a Committee of the House of Commons. These means may so fill out information on the subject as to supply, in considering the question of the exploration suggested, ample ground for the strength of presumption proper as a basis of great outlays. If doubt preponderate after exhausting all sources of present knowledge on the subject, then but little addition to the ultimate cost of the whole field-work would follow by confining the first surveys to *one* of the four zig-zag lines suggested. Ten field-parties ought to be sufficient to run out that initial test-line in one year; and to obtain thus—at a cost of about $50,000—a positive basis for determining the question of running out the others.

If the four lines necessary to complete the exploration be pressed forward together, they should be carried on in connection with commissariat-posts at regular intervals along the lines of travel by canoe. A huntsman, a voyageur, and a man-of-all-work to clear and cultivate three or four acres, would be a sufficient staff at each of these—the huntsman and the farmer to keep up the supplies of food and the voyageur to forward them from time to time to the party operating from that voyageur's depot. These headquarters of each section of the survey would supply an office to the fieldsmen for digesting their work in maps and notes during the winter. They would constitute astronomical stations, meteorogical stations, and a means of settling the question of soil and climate throughout the whole region, by tests of actual cultivation of garden and field. And besides the economy in supplies, these stations would effect a still greater economy in working result by keeping the parties on the ground ready to take the field at the earliest moment, and to hold it to the latest.

Even the first zigzag survey-line would settle the question as to the character of the country sufficiently to decide the general expediency of the proposed route. That conclusion might be followed without more ado by proceeding with location surveys from Quebec up the St. Maurice, and from Norway House to what may be regarded a

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settled point on the route—the Saskatchewan at Big Bend. Beginning construction on the latter, so as to open up the fertile belt of *the North-West* by gradual advancement of the railway, simultaneous construction should be commenced at Quebec, so as to give immediate access to the fertile belt of *the North*.—The energies of the country should surely not be concentrated on a field of agricultural development 1,300 miles away, while they neglect, while they pass by, a field of agricultural development within twelve hours' run by railway from the emigrant ship, from the centre of abundant domestic resources of settlement.—The valley of the St. Maurice penetrated at a dash to the gateway into the domain of the agricultural clays at its head, subsequent advance keeping, as on the division westward from Norway House, somewhat ahead of the incoming population, the progress beyond that House having reached such a stage as to supply a sustaining traffic to the railway, the slow movement of construction in the east could be exchanged then for rapid work connecting the line on the other side of the Nelson with the line from the St. Lawrence. The railway completed from Quebec to Pine Pass, completed under a policy at once cautious and dashing, the extension to the Pacific might be taken up when the means for its construction should have been realized from the lands of either or of both of the fertile belts; and if British Columbia cannot await the necessity of the country, let British Columbia receive now what would be of much more real benefit to her than the letter of her bond—four or five millions of dollars for roads and bridges, including, until the time comes for superseding it by the railway, a good stage-coach-road from Pine Pass* to Kamsquot. The extension of the railway carried out at the proper time, the whole line from tidewater to tidewater would have been completed—opening up marine intercourse on its way by inland navigation to and from Port Nelson—under conditions of financiering, of traffic, and of mechanics lending the highest possible energy to its attractive force on the eastward commerce of Japan and China.

Compared with the adopted route, the proposed route presents the British American highway to the Pacific in a very different aspect to the Imperial Government. As a means of defence, as a means of retaining agricultural emigration within the limits of the Empire, as a means of placing the existence of the Dominion on a footing of breadth and permanence, it is a common interest of Great Britain and Canada. As a line of postal and military transportation on British soil, to the Northern Pacific; and as a means of equating the material forces which go to give the United States supremacy in the diplomacy of the Nations on the eastern shores of Asia, the Canadian Pacific highway is an undertaking of great interest to Great Britain specially. The results of its construction being of great value to each of the

* Ungracious as it may seem to have made so many references to Pine Pass without mention of the name of Mr. Marcus Smith, it is but simple justice to say that, in maintaining professional ground against the set of the official current on the question of the crossing of the Rockies, that gentleman has done good and honorable service to the country.

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beneficiaries in common and severally, the cost of its construction should be borne by both. An Imperial guarantee would, it is true, assist Canada in bearing her part of the burden; but costing Great Britain nothing, that guarantee cannot be held fairly as a discharge of her obligation in the case; and if the railway be proceeded with to completion by Canada, Great Britain will certainly never volunteer to bear any part of that obligation.

The chief interest of the Dominion in the Pacific Railway lying on this side of the Rockies, the chief interest of the Empire in it lies on the other side—in its extension to the Pacific. Even if prudence did not demand that Canada pause at Pine Pass with the work until, at all events, she shall have replenished her treasury from the lands along the route, she is bound by plain duty to herself to pause there if only to await the pressure of Imperial interests on Imperial fairness. British Columbia satisfied by a generous contribution to her local interests, there is, therefore, not only no reason why Canada should encounter the dangerous strain of undertaking the works beyond the Rockies at the present time; but there is very good reason why she should *not* do so, if only to throw a fair proportion of the cost of the whole enterprise on the other beneficiary of its construction.

The highway across Canada on the route proposed would exert wide influence. It would supply to the Maritime Provinces of the Dominion a bond of permanent union around the North-Western core, in a reciprocity of great interests. It would give Canada a rear as a support for her front; an interior as a retreat for her frontier. Supplying her with a safe base upon the sea, it, as a line of military communication, would multiply her powers of defence. Demanding at Norway House that the 370 miles of River to Port Nelson be made navigable, it would open Hudson's Bay by degrees to a commerce based on wheat. Rearing a City of Archangel on a new Canadian seaboard, it would take Canada outside the conditions of a geographical supplement, in a fullness of border giving fixity to her organization by awaking in her people a sense of empire. Throwing open to her Hudson's Bay and also the Northern Ocean between the mouth of the Mackenzie and Behring's Straits, it would make both, with their navigations and their fisheries, British "preserves." As the sceptre of commercial Empire on the western shores of the Atlantic follows supremacy in breadstuffs, as it followed that supremacy from Boston, on the construction of the Erie Canal, to New York, so will it follow from New York when the construction of the trans-continental highway through the inexhaustible soils and boundless areas of the Canadian wheat-fields shall have planted the seat of breadstuff-supremacy at Quebec. And the Pacific Railway having won that triumph for Canada in commerce, would carry her on by its development of her resources and consolidation of her Provinces to its sequence in politics, infusing into her such a flush and vigor of national life as would make this Western Continent what Lord Beaconsfield has anticipated—"an America of diplomacy."

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